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NUMBER 1—1924.

JANUARY, 1924.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines.

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OFFICE OF NAVAL INTELLIGENCE.

MONTHLY INFORMATION BULLETIN.

NUMBER 1—1924—JANUARY, 1924.

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The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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GREAT BRITAIN.

IMPERIAL RADIO CHAIN.

November, 1923.

IMPERIAL RADIO CHAIN.

One of the most important subjects discussed at length in the recent British Imperial Economic Conference in London was that of the Imperial communications systems of the British Empire. The radio chain around the world, cables, and airship systems, each came in for its share of protracted discussion and consideration. Both subjects have been dealt with at length in the press.

There follow herewith some of the most important articles from the press.

The following newspaper reports of statements in conference are of special interest:

Mr. BRUCE, Prime Minister of Australia. It does not appear that the wireless in the Pacific is in a particularly satisfactory condition from the point of view of Britain and the Empire generally. We do not appear to be the people who are likely, in the future, to control the wireless in the Pacific Islands. We certainly shall have competitors. If Australia is going forward with this big wireless scheme, it is very possible that we should be in the position where we may more or less ensure the predominance of the Empire in the Pacific. There are various questions with regard to it: The question of Fiji, the question of enlisting the support and assistance of the High Commissioner for the Pacific. But again I think that these are questions which need not delay the conference. I am sure the conference would desire that we should advance our wireless because it would be very valuable from the defense standpoint in time of trouble.

Mr. AMERY. Perhaps I could answer at once on that. The whole question of the Amalgamated Wireless Company erecting a chain of stations in the Pacific for the use of the Islands has been up before the imperial communications committee. As far as we were concerned, we have blessed it. I think there remains an outstanding question as to how far Fiji can come within the scheme. We may say that generally we are entirely of the same view as Mr. Bruce, and I think the thing is fully in train.

Sir L. WORTHINGTON-EVANS. We declined the Marconi Co.'s offer because we wanted to be able to do the routing ourselves. * * * And so that negotiation practically broke down upon the point of who was to control the routing of messages.

Mr. INNES. With the prospect of an Indian wireless company, which we are now considering, our needs are adequately met for some time to come. As regards wireless, we have always taken the view that if possible we should entrust it to private enterprise, naturally imposing the most careful safeguards

upon that private enterprise. Those are the lines upon which we are now working. I understand that the Government of India is now actually considering the question of placing a contract with a bona fide Indian wireless company to start a big wireless station.

The CHAIRMAN OF THE EMPIRE PRESS UNION. The British Empire had apparently lost any chance in the near future of getting the supremacy of wireless in the Pacific and it had lost its position in the Far East and in Europe. The British post office had finished the Leafield station and the Cairo station. The Leafield station had been operating successfully and sent out a foreign news service—quite well done, but entirely unsuitable for the Continent, which it reached, and quite suitable for the Dominions, which it did not reach. The news circulated by the Foreign Office British official wireless would be better done by an independent news agency. Leafield station, though working well, was not being used for the purpose for which it was primarily established, but was used almost entirely by American newspapers. It could not send to India or any far distant part of the British Empire.

Lord BURHAM (president of the Union). In January and June, when a deputation saw the Postmaster General, they were led to expect that in a very short time we should be abreast of the wireless communications of the world. He heard with apprehension that any great power had obtained, if not a monopoly, a large share of wireless propaganda in the East or any other part of the world.

Mr. J. O. FAIRFAX (chairman of the Australian section of the Union). An empire spread over the seven seas should, above all others, have this wonderful power of spreading news. He suggested that the matter was one of public policy rather than economy and ought to go before the imperial conference rather than the economic conference.

CABLES.

Postmaster General stated at the imperial economic conference:

There is one part of the Empire in which cable communications are not in such a satisfactory condition. I am speaking of the West Indian Colonies. The scheme involves the provision of a new cable from Turks Island to Barbados, whence it will bifurcate to Trinidad on the one hand and British Guiana on the other. The smaller islands will be served by a number of wireless stations, subsidiary to the cable which will also connect with a central station at Barbados. The new cable will also connect with Canada via the Halifax-Bermuda cable. Tenders are on the point of being invited for the cable required, and I hope the order will be placed in a few weeks time. All the traffic initiated by the Imperial Government to Canada, Australia, and New Zealand is sent via Imperial, but we have reason to know that several of the departments representing the Canadian and the Australian Governments in London and some of the Government departments in the Dominions themselves still use the competitive routes either of the American or the Eastern companies, and I should be very grateful if the Prime Ministers of Canada and Australia could see that all the traffic over which they have control is sent via the Imperial route, which is certainly not inferior to its competitors, either in speed or in accuracy.

Mr. BRUCE, Prime Minister of Australia. We take the view that the establishment of an all-British cable service is an admirable thing that we should all support.

Mr. ORMSBY-GORE. An all British route is very necessary in that part of the world [West Indian Colonies] for defense reasons and others in the neighborhood of the Panama Canal.

The imperial economic conference passed three resolutions:

(1) That representatives of the Dominions and India should be associated in the work of the imperial communications committee when questions of interest to them are under consideration.

(2) That in view of the fact that the Dominions interested in the Pacific cable have for a long time pressed for the provision of a State-owned Atlantic cable route which has now been provided.

(3) That in any concessions given in the British Empire to private enterprise in respect of cable or wireless services, including broadcasting stations, preference should be given to British Empire companies.

GREAT BRITAIN.

SOME NOTES ON LIGHT CRUISER "DELHI."

November, 1923.

Trawler bows.

Revolving airplane platform for launching airplane abeam. This platform mounted immediately forward of searchlight platform which is just forward of the mainmast.

Battery: Six 6-inch, 30° elevation, mounted on center line, all protected by armor shields; two 3-inch, antiaircraft guns; two 2-pounder pom-pom.

Torpedo tubes: Four 21-inch triple type deck mountings, 2 each side, mounted at extreme outboard edge of deck. The center tube is mounted above the other two tubes. The chief advantage of this type of triple mounting appears to be that a much smaller space for the mounting is required. It was stated that the torpedoes, with this type of mounting, must be launched in succession at short intervals. Carries 12 torpedoes only, all in tubes.

It was stated this vessel was designed for 29 knots, and can make it readily now. From the confidence with which the statement was made, it is thought that possibly this class of cruisers can exceed 29 knots.

There are two large searchlights mounted on the searchlight platform aft, just forward of the mainmast. The only other searchlights are signal searchlights on the signal bridge.

The directorscope is mounted on the foremast, and it was not permitted to be seen.

The general control station is on a level with the navigating bridge and immediately abaft it. The sides of this station are of 1-inch armor and it is open at the top. Mounted, in duplicate, in the general control station are Evershed control instruments for the battery,

searchlights, and torpedo control, one set of instruments for each side. There were also what appeared to be master firing keys for the battery and for the firing of torpedoes, torpedo directors, and firing keys for firing torpedoes. It was stated that the torpedoes were fired from this position. Voice tubes and telephones were used for fire control, searchlight, and torpedo control communication. It was stated that additional searchlights might be installed later. The primary system of fire control is with the Evershed instruments which is a synchronous system which indicates the angle of elevation and train on the Evershed receiver at the guns, searchlights, torpedoes, etc., and when the guns, searchlights, and torpedo tubes are trained on the proper angle, it is indicated on the combination transmitter and receiver control station. On each wing of the navigating bridge there are mounted also two master Evershed controllers, one for the battery, and one for the searchlights.

It was stated that the high trawler bows resulted in a very dry ship and give an especially dry gun platform for the forward gun, which they considered a great advantage on fast light cruisers which almost always require the bow guns in any fight. The gunnery officer stated also that that class of light cruisers were very seaworthy and gave a good gun platform. The gunnery officer stated that they carried a crew of about 475.

The light cruiser *Frobisher* was also observed at the dockyard, Devonport. The vessel is fitted with airplane housing immediately under the navigating bridge. It was stated that some difficulty had been experienced with launching airplanes from the light cruisers which had this system of airplane housing, and that it was always necessary for them to head into the wind; and that the revolving airplane platform aft, as mounted on the *Delhi*, had been found to be superior.

The arc of fire of the forward gun is restricted at short ranges by the trawler bow, but it is not a serious disadvantage.

GREAT BRITAIN.

VISIT TO GUNNERY SCHOOL, DEVONPORT.

November, 1923.

A brief visit was recently made to Devonport Gunnery School.

The staff of this school consists of 1 captain, 2 commanders, and about 6 lieutenant commanders and 8 lieutenants; the number of officers in the latter two grades varies from time to time, depending upon the number of personnel under instruction. Although a few junior officers take a short course at the gunnery school, Devenport,

it is primarily for the training of enlisted personnel. After visiting the gunnery school, Whale Island, one could not escape being surprised at the duplication evidenced at the gunnery school, Devonport.

During a visit to Chatham Royal Dockyard, the gunnery school there was not seen, but it was stated at Devonport that the school at Chatham was similar to the others in size, scope, and activities.

The Devonport and Chatham Gunnery Schools train all of the enlisted personnel for all vessels of each class, which are based upon these two places, respectively. Devonport trains about one-third of the enlisted personnel; the personnel trained at Chatham is slightly less than this; and the Whale Island Gunnery School trains the remainder. The Whale Island Gunnery School, of course, trains practically all the commissioned personnel as well.

The gunnery school, Devonport, is housed in six fine brick buildings, and it was amusing to note that the officers complained because they had not been able to have large gray stone buildings similar to most of the other buildings at the Devonport Dockyard, which had been erected some time previously. In addition to the six buildings mentioned, there is one large building for housing personnel, administrative offices, quarters for the staff, and a large mess for commissioned personnel. This so-called mess amounts to a club, and has a number of rooms equipped as a club, the stewards for running it being enlisted personnel.

The other buildings house the various activities, including instruction in explosives, fuses, magazines, projectiles, antigas training, loading, gun laying and training, fire control, range taking, night firing, searchlight control, turret drill, and detailed instruction in various parts of all ordnance material found aboard ship. Every man is put through several days antigas training, including the use and care of gas masks.

Training with torpedoes is undertaken at Devonport in the *Defiance*, including three hulks. The staff of the torpedo school ship *Defiance* is indicated on page 745, Admiralty Monthly Navy List for November, 1923.

No instruction in mines or mining is attempted at Devonport. Practically all training and instruction in mining is done at the torpedo and mine school, Portsmouth.

One building termed the "shooting gallery" is exclusively devoted to ex caliber practice and training with dotters. The most interesting part of this gallery was that devoted to training for night firing practices. This part was shut off and could be completely darkened. Night firing practice was simulated in every detail as far as possible. The gun captain gave all commands exactly as in target practice. The regular gun crew was stationed at the gun;

one of the gun layers pressed the firing key, and a small ex caliber rifle fired, and in addition to the flash of the gun an electric flash was produced in front of the gun layers and trainers' telescopes to represent the flash of the discharged gun, as would be the case in actual firing. This flash in front of the telescopes was produced simply by a connection to the firing key of the gun layer.

The target was a minature capital ship. Flashes of searchlights and gun flashes on the target ship were reproduced on the miniature model target. The effect of the searchlights of the firing ship were also reproduced.

The effect was very realistic, and was stated to have been of great assistance in the training of the gun crews, principally those that had never been through target practice.

Similar night firing practices are conducted in the case of anti-aircraft guns in the same shooting gallery. The simulation of the actual firing conditions mentioned, including a rolling motion of the gun platform of the firing gun, is considered excellent. It shows how far the British develop the training of enlisted personnel on shore, of which there are many other indications.

JAPAN.

NAVAL NOTES.

November, 1923.

[From the Japanese press.]

SUBMARINE FLOTILLA TO TAKE LONG CRUISE.

The vessels of the eleventh submarine flotilla under the command of Commander Asabayashi will start on a long cruise round Shikoku Island, leaving Sasebo Naval Station, November 14, 1923. Accompanied by the depot ship *Chiyoda*, the submarines will go through the offing of Tosa, passing through the Bungo Channel and, after carrying out a cruise in the Pacific outside Shikoku Island will enter Osaka, passing through the Kii Channel in about a week. On its return cruise the submarine flotilla will make a survey of the water currents in the Inland Sea, returning to Sasebo November 22. The vessels will carry on board the officers who graduated from the submarine school last term.

NAVAL AVIATORS NONSTOP FLIGHT.

The navy aerial corps at Yokosuka is planning to carry out a long cross-sea flight with two waterplanes of No. 5 type, about November 7, 1923. The flight will be a nonstop one and the route will cover a distance of about 400 nautical miles both ways. The flight will be carried out twice, the aviators flying on the first day to a point about 250 nautical miles in the Pacific, south of Choshi, and return to Yokosuka without stopping. On the second day they will fly to a certain point in Enshu Bay and return to Yoko-

suka without stopping. The airplane depot ship *Hosho* and the vessels of the Fifteenth Destroyer Flotilla will be detailed as guard ships on the occasion. The practice is an unprecedentedly daring venture in navy aeronautics, and has been decided on as a substitute for the prearranged aerial practice in the annual grand naval maneuvers which have been abandoned this year on account of the seismic disasters.

About the same time the naval aerial corps at Yokosuka and Kasumigaura will jointly carry out a bomb dropping practice in the offing of Yokosuka with S. S. airship and *F. No. 5* aeroplane, probably on November 7 and 8.

DESTROYER "NO. 7" LAUNCHED.

Japanese destroyer *No. 7* (first class, 1,400 tons), which was in course of construction at Maidzuru, was launched on October 30, 1923. She will be equipped and completed by March, 1924, and is to be assigned to Yokosuka.

ALTERATION OF CAPITAL SHIPS.

The navy has obtained the approval of the finance office for an appropriation of 26,000,000 yen for the alteration expenditures for capital ships. The finance department insisted that the completion of the alteration program be postponed from 1930 to 1936 and that the appropriation be proportionately spread over that time, but the navy department strongly disapproved. An agreement was finally reached whereby the navy gets the 26,000,000 yen, covering the years 1924–1930, during which time the navy expects to alter six ships.

NEW NAVY FUSE.

The navy which has for several years past been working on an invention to improve the fuse, has at last succeeded in its effort. The new fuse is to be tested for one week at the Kamegabuki gun-testing grounds in the presence of the commander in chief of Kure and other officers dispatched from the navy department for the purpose. No details of this fuse have been obtained.

AIRPLANE CARRIER "AMAGI."

The press reports that the Japanese Navy will request the allied powers for permision to convert the *Kaga* into an aeroplane carried instead of the *Amagi*, which is reported as bady twisted in the keel. Also, it is reported that the *Amagi* is being disintegrated and that the *Kaga* is going into dock at Yokosuka preparatory to reconstruction work. Some foreign press representatives have to-day gone to Yokosuka by invitation to inspect the station. I instructed the American representatives to ascertain he reason for so hurriedly starting disintegration of the *Amagi*, and also the reason for expending 80,000,000 yen, which has been approved, for the reconstruction of Yokosuka, which the navy department has stated was not seriously damaged. Also, in this connection, I learned yesterday that an order had been placed with the German firm of Strauss & Co., of Bremen, for 200,000 barrels of cement for delivery to Japan and to be used mostly at Yokosuka.

PART OF NAVAL TECHNICAL LABORATORY TO BE MOVED FROM TOKYO.

It is considered too expensive to restore the naval technical laboratory, destroyed by the recent earthquake and fire, to its original condition, and it has therefore been decided to reduce its organization, transferring part of it to the experimental branch in Kure and Yokosuka yards. As regards the work in connection with experimental tank, aviation, etc., this can not very well be transferred and will be left in Tokyo. Research work in gun making will be transferred to Kure, while that in torpedo making will be transferred to Yokosuka. It is estimated that 3,000,000 yen will be required for the restoration of the technical laboratory as above mentioned.

NAVAL AIR SERVICE "WIND CAVE."

The "wind cave" which was situated in the naval arsenal at Tsukiji, Japan, was destroyed by the recent earthquake and fire. Before the earthquake it was planned to establish a branch at Kasumigaura and the work was to be started this year. However, since the main cave has been destroyed it is proposed to rebuild it at Kasumigaura. The work on this is expected to be started in the coming spring.

TWO MORE HYDROPLANES FOR SASEBO.

Two hydroplanes having been completed by the Nagoya Clock Co., about 20 officers and men arrived from Sasebo on November 14, 1923, for the purpose of assembling them and making trial flights, and they will be taken to Sasebo November 25, 1923.

Two hydroplanes manufactured by the Aichi Clock Co., Nagoya, will be sent by air to Sasebo November 4 or 5, and two more will be sent there by the end of the month.

JAPANESE GUNBOAT "KATATA" COMPLETED.

The gunboat *Katata* was completed on October 22, 1923. Lieut. Commander M. Tsuchiya was ordered to command.

JAPANESE OIL TANKER "MAMIYA" LAUNCHED.

The tanker *Mamiya*, 17,500 tons, which was under construction at the Kawasaki Dockyard, Kobe, was launched on October 26, 1923.

SINKING OF SUBMARINE "NO. 26."

Submarine *No. 26* after returning from exercises in Hiroshima-wan, secured alongside the cruiser *Yahagi* in Kure Harbor. While repairs were being made to a torpedo tube the boat began to sink at the bow, and before steps could be taken to check her, she sank to the bottom in 8 fathoms of water. The officers and crew of the boat were not lost.

At the time of the accident a memorial service for the crew of submarine *No. 70* was being held at Kure.

The salvage operations are under Capt. I. Tanaka, and it is not predicted that the task will be difficult. No details other than the above have been received.

DISCHARGE OF NAVY-YARD WORKMEN.

The following dismissals of navy-yard employees and arsenal works will take place the end of November, 1923:

Yokosuka	1,700
Naval research laboratory, Tokyo	500
Kure	1,000
Maidzuru	800
Sasebo	500
Hiratsuka powder works	100
Total	4,500

Each of the dismissed workmen will receive 10 days' notice and a special disarmament allowance.

MAIDEN FLIGHT OF NEW S-S DIRIGIBLE.

The new dirigible which was completed at Yokosuka on October 9, 1923, made a successful trial flight October 16, 1923. She left Yokosuka at 9.30 a. m. and arrived at Kasumigaura at 10.30 a. m. She left Kasumigaura at 1 p. m. and returned to Yokosuka by way of Tokorazawa (army aviation station). This military triangular mail flight will be carried out once a week on Tuesdays.

NAMING OF SUBMARINES.

Information has been received from the Japanese Navy Department that they will soon adopt a new system of naming their submarines to avoid confusion in distinguishing the various classes. The system will be to call the first class submarines *I–58*, *I–59*, etc., the second class will be called *RO–34*, *RO–35*, etc., and the third class will be called *HA–8*, *HA–9*, etc. It is not yet known what numbers will comprise the I, RO, and the HA classes as the navy department stated a decision had not yet been reached in that regard. The navy department has promised more definite information on this subject some time after December 1, 1923.

LIGHT CRUISER "SENDAI" LAUNCHED.

The second class cruiser *Sendai*, 5,595 tons, which was in course of construction at the Mitsubishi Dockyards, Nagasaki, was launched October 30, 1923.

SUBMARINE "NO. 26" REFLOATED.

The submarine *No. 26*, which sank a few days ago in Kure, has been refloated. The interior of the submarine is full of water, which made its way in from the torpedo tube, but no water is in the main tank. Submarine *No. 26* is of 900 tons displacement. She was manned by Commander Asayama, commander of the Eleventh Flotilla, and 39 other officers and men.

JAPAN.

POLITICAL CONDITIONS.

November, 1923.

SUMMARY.

The opinion of some well-informed observers is that Japan has gradually been moving toward a revolution. Whether this be true or not, it is a fact that the Government, worried by the clamor of socialistic elements, is tremendously influenced by these factions and is making every effort in these days of unsettled conditions, resulting from the earthquake, to effect an administration that will pacify socialists—particularly labor unions. With this purpose in view the cabinet has adopted a new and more liberal franchise bill.

For months past socialistic disorders have been attaining greater prominence throughout Japan. Clashes between industrialists and the police have become more frequent and at times it has been necessary to call out army detachments to assist the police. This fact would ordinarily be of no consequence, but it is strongly indicative of considerable revulsion when the inherent regard of the Japanese for law and order is considered. The Japanese have been raised to look upon the authority of the law with fanatical reverence and a disregard of authority is only inspired by feelings of great emotion.

The recent earthquake disaster revealed the mob psychology of the Japanese in the first few days of the emergency and illustrated the extent to which the Japanese mind runs when the mob leaps the bounds of the authorities. Other indications have been noted since the panic of the disaster subsided to illustrate the feelings of the authorities toward socialism. A few instances are noted herewith:

1. The Government has been accused of permitting the wholesale killing of Koreans, for the reason that the Japanese were thereby united and diverted from socialistic tendencies. It is believed that this accusation is not merited, but its existence indicates that the Government is faced with problems of socialistic nature.

2. The Government has used its power to persuade insurance companies to make payments to policyholders. It is questionable whether this action is more for reconciliation to labor unions or for help to the manufacturers.

3. The wealthy class of Japanese were for days after the earthquake loath to have the leisure of their lives displayed to the working classes and the golf and tennis clubs were actually closed as a result of fear of the lower classes.

4. The governmental tendencies of the cabinet seem united upon legislation shown below, which it is believed is influenced by a fear of socialism.

At a dinner recently, Doctor Dan, one of the most prominent business men of Japan, told the author of this report that, though the destruction wrought by the earthquake was tremendous, the wealth-producing industries of Japan were not so vitally concerned; that most of the destruction was to nonwealth-producing properties. He then went on to say that the industrial condition of the country had been constantly becoming more unsettled, and that the most serious effect of the disaster to Japan was the upheaval of labor, which he said was sure to follow. He predicted that if the Government did not handle this situation with extreme caution and wisdom, that the result would effect a crisis of far greater consequence to Japan than the earthquake itself.

Some of the salient points of the new franchise-bill draft agreed upon by the cabinet on October 22, 1923, are as follows:

I. The electoral right:
  (1) The electoral qualifications in taxation will be abolished.
  (2) The electoral right will be granted to a Japanese male subject aged not less than 25 years.
  (3) The electoral right will be granted even to the students who are Japanese subjects and aged not less than 25 years, although by the present law students are exempted.
  (4) Electors must reside in the same constituencies, for which they are chosen, for not less than six months before the date when lists of electors are made.

II. The qualification for election:
  (1) The right to be elected is to be granted to a Japanese male subject aged not less than 25 years.
  (2) Shinto and Buddhist priests, other religious teachers, and teachers of primary schools are to be given the right of being elected, although they are not eligible by the present law.

III. Other regulations:
  (1) The head of peer's family is to be given the rights to elect and to be elected. He is not given the same rights under the present law.

IV. Date of introduction:
  (1) The franchise bill will be introduced in the next session of the Imperial Diet at its beginning.

V. Revision of the regulations regarding penalties:
  (1) The regulation will be changed to make penalties severer.

VI. Constituencies:
  (1) Some proper revision will be made regarding constituencies.

JAPAN.

SALVAGE OF SUBMARINE "NO. 70."

November, 1923.

On October 18, 1923, submarine *No. 70* was raised to the surface and pumped free of water. About 88 corpses were recovered. The

boat was towed to Kawasaki dock in Kobe. When the submarine was raised it was found that several of the deck hatches were open. No information has been obtained to indicate the cause of the casualty. The submarine had been running trials, and in addition to her own crew she had a number of dockyard representatives aboard. The submarine had been running submerged; she came to the surface and suddenly started down at about a 30° angle by the bow. Water poured in through the hatches and conning tower before they could be closed. It appears that loss of control was caused by the flooding of one or more of the forward tanks, though no details have been learned. A board of inquiry consisting of the following have been appointed to determine the cause: Rear Admiral Otani, Captain Nakago, Captain Kishii, Captain Shieoka, and about 10 others.

The hull of the sunken boat was insured with the Mitsubishi Co. for 2,500,000 yen on the condition that should the hull of the boat be totally destroyed the company would pay the whole amount. Since the naval authorities are inclined to repair the hull and use it again the company will have to pay only the amount required for its repair. But if the cost of the repairs exceeds two-thirds of the whole amount of the insurance the company will have to pay the entire amount—that is, 2,500,000 yen—to the Kawasaki Dockyard. Captain Takahashi was in charge of the salvage operations.

JAPAN.

SOME IMPORTANT ASPECTS OF JAPANESE CHARACTER.

November, 1923.

In a little more than 50 years the Japanese Government has taken over and adopted for the people of Japan, with the Christian religion forming almost the solitary exception, what is commonly called western civilization. Undoubtedly the people have been acquiescent to this change, but it has not been a change by absorption of western ideas, as is occurring with ponderous slowness in China to-day, but largely by government edict.

It follows, therefore, that a people, merely acquiescent to ideas of which they have no conscious grasp, but by which their conduct is governed as by a set of rules, will, in time of great emergency, revert to their natural state of civilization and react to their native tendencies or will await the dictum of authority before acting at all. Certainly those not immediately affected by the calamity will continue largely as if nothing had happened, until they are confronted personally and directly with the actual tangible evidences of it, or

are directed by the authorities to adopt measures duly indicated for adoption through customary channels.

If we accept the above thoughts and their correlation as promises, much of the strangeness and contradictoriness of the Japanese reaction to the Tokyo-Yokohama earthquake disappears.

Undoubtedly there has been a change in the Japanese attitude toward white foreigners in the last 25 years. It is shown mainly in the inexplicable something that makes one know that the Japanese individual generally is endeavoring to demonstrate that he is as good as anyone and perhaps a little better. It is the same assertive something that was so conspicuous in certain types of Germans before Germany's downfall—a combination of conceit, and of suspicion that perhaps the conceit is not justified. I have visited Japan in 1900, 1903, 1908, 1910, and again at the present time. The change of which I speak is undoubtedly a definite change, but it is not apparent from my personal observation that the change in attitude toward white foreigners is more pronounced toward Americans. It is the change from an air of polite deference to one of distinct aloofness and reserve. It is possible to break through this reserve, but the fact remains that it exists and was not particularly impaired as a result of the present catastrophe.

My observation of the reaction of the Japanese officials, civil and military, and of the Japanese people in general, to foreign activities in the present emergency leads always to the same conclusions. The officials could not comprehend the sincerity of any offer of general assistance and were constantly endeavoring to determine the motive; the people generally believed foreigners were present to help their own nationals, or at least, other foreigners, and I believe it will be one of the sincerest proofs of the Japanese Government's gratitude, if finally the reading public of Japan are permitted to find out that direct and personal foreign aid was tendered on the spot to Japanese who were destitute and in need. Certainly various native papers have done their utmost already to discredit the conduct of foreigners during the earthquake and fire, publishing such articles as the turning away of Japanese from the *Empress of Australia* at revolvers' point (Tokyo Nichi Nichi), and a somewhat similar set of articles in the Kobe Yushin Nippo. It is a question of just how widely the knowledge of what foreign aid was directly rendered can be spread or will be spread by Japanese who were its direct beneficiaries.

The attitude of the Japanese officials toward American naval forces engaging in relief work changed from vague suspicion to at least surface gratitude in many cases, or to indifference and a desire for our withdrawal in others. Whether the gratitude, frequently and

variously expressed, was more than superficial, it is difficult to determine. The truth lies probably in between. Some gratitude and appreciation was sincere, some was actuated merely by that impelling force that seems able to shape the putty-like mind of the average Japanese to whatever purpose serves its end. For instance, two Japanese destroyers, presumably basing on Kobe, got under way in a nasty bit of weather attendant on a near-by typhoon and anchored outside the Kobe breakwater near where the *Pruitt* had shifted berth to take on needed fuel oil. They were apparently preparing to leave once more, as the *Pruitt* completed fueling and returned to her former berth inside the breakwater. They were evidently satisfied that the *Pruitt* intended no harm. A few days later, after the publication of the Japanese Premier's expression of appreciation for United States aid, in which he especially mentioned the activities of our naval vessels, a boarding officer from the Japanese destroyers came aboard for no other apparent purpose than to deliver a set message in English voicing the gratitude of Japan for the help the United States Navy was extending.

Foreign refugees in Kobe were handled through the earthquake relief committee, an excellently organized international committee composed of white foreigners, including all members of the white consular body in Kobe, and presided over by the dean of the consular corps, the British consul general. The relief measures taken by this committee deserve the highest praise. There were certain peculiarities about it, however, that reveal the curious isolation of even the permanent white residents of Japan from the community in which they live. The committee appears to have been formed entirely at the initiative of the foreigners themselves, without any evident reference to the Japanese local officials. There was at first no liaison with any Japanese relief organization, nor did the committee know officially or privately in what activities the Japanese relief organizations were engaged. I found this condition existing on September 10 when I reached Kobe from Yokohama, and called attention to this want of liaison and to the fact that only white foreigners were being looked out for by the committee. That these conditions were recognized by the Japanese was evident in that a day or so later, a committee of representative Japanese, including, I understand, the mayor of Kobe, called on the various consular officials and at the headquarters of the relief committee, thanking them for their activities in relieving foreigners and offering them Japanese aid in case they desired it. There were also money contributions made by Japanese to this committee, in one case a contributor who insistently witheld his name financing the relief of several destitute foreigners living in one house. It is worthy of note

that the relief committee did finally widen its scope, rendered material aid to the Chinese refugees, and established a very imperfect liaison with the Japanese through one member of the committee (an ex-British army officer), who negotiated a plan by which the Japanese administered the Russian refugees, while the international committee provided them with food and bedding. At the time of my leaving I understood the Japanese were also feeding the Russians. It is pointed out that certain Japanese in Kobe liberally contributed to foreign relief, turning over their funds to the foreign relief committee. It is also pointed out that Japanese wives of white foreigners and Eurasians generally were handled by the foreign relief committee, who also aided the Chinese. On the other hand, the Japanese consistently aided the Chinese refugees in Kobe, so far as I could ascertain, from the very first, although the Chinese maintained their own relief organization. The Japanese apparently also kept some touch with the Russian refugee situation, even while the Russians were being administered practically entirely by the foreign relief committee. In this general connection, there is another matter, of which I have only indirect information, which appears worthy of investigation. It is the persistent report that certain white refugees are remaining near Yokohama and have been endeavoring to obtain relief through white agencies. It is not apparent whether they can not or simply will not apply to the Japanese for relief. It is presumably the latter, but the fact remains that these foreigners at Honmoku and Negishi are in such a state of mind that they are unwilling to ask for Japanese aid even when in reasonable need of it.

Part of the supplies furnished by our naval forces at Kobe went directly to the relief of foreigners and Chinese in and about Kobe, while for the greater portion were turned over directly to the Japanese through the local governor. Supplies turned over to the Japanese appear to have been partly employed for local relief and partly reserved for transshipment to the Tokyo-Yokohama region.

No first-hand information is at hand as to the relief work done by the British and French naval forces.

Doctor Daland, who, I understand, is a well-known diagnostician, and member of the University of Pennsylvania Medical College staff, and who, I know, has been making an extended tour of observation for several months in Korea and Japan, gives a very circumstantial account of the difficulties encountered by one of our embassy staff in traveling from Tokyo to Nikko after the earthquake and fire. The incident, as related, is chiefly remarkable as an indication of the panic stricken and barbarous state of mind large masses of the community, including police and soldiery, were in, while normally, from our point of view, all efforts should have been bent

to the relief of immediate distress. It has to do with the repeated stopping of an automobile containing white foreigners, men and women, by armed mobs of mixed civilians, police, and soldiers, the rigid and threatening investigation of the entire party, and the apparently reluctant release of the machine, which passed on only to be stopped again and again and the process repeated.

During the call of the vice admiral commanding the Kure Squadron, which, by the way, carried on target practice about September 5, apparently in accordance with the regular schedule, and left for Yokohama for the first time after the earthquake on September 22, I inquired of the fate of the *Mikasa* and one light cruiser, which I understood were damaged. Only slight damage to the *Mikasa* was admitted and no damage whatever to any light cruiser. It is possible, of course, that the admiral did not know of the very serious damage to one of the Japanese light cruisers, of which, I believe, one of our officers has photographs.

The relations with the American commercial vessels visiting Kobe and acting under the orders of the commander in chief were extremely satisfactory. There was cordial and energetic cooperation and I have nothing but praise to offer for the conduct of all concerned.

There are many contradictions in the reports of the reaction of the Japanese generally to the great earthquake catastrophe. Naturally, reports are unconsciously colored by the personal predilections of the observer. Some are obviously generalized from particular and somewhat isolated incidents. Notably in this class are those which redound with praise of the Japanese because of the numerous incidents of faithfulness and devotion on the part of servants. Servants, however, are in a class by themselves the world over. By temperament a servant is loyal to his master, if he is an average servant. In serving his master's interests he serves his own. It is creditable that Japanese servants generally were loyal to their employers, but so, generally, are all servants, wherever found, in times of calamity. It is hardly convincing to generalize from the conduct of the serving class to the conduct of the nation to which they belong. Many praiseworthy reports come from trained observers who arrived late on the scene of disaster, after a lapse of perhaps 10 days or two weeks. Such reports deal especially with the energy and the zealousness of the work being conducted by the Japanese in Tokyo, of their efficiency in handling the evacuation of the few refugees who remained at that late date, of their effective managing of the situation generally. Weighed in the balance against these undoubted truths are the callous conduct of the Japanese merchantmen and men-of-war in and about Yokohama during the

actual burning of the city, the hideous outbreaks of lawless unrestraint directed mainly against the Koreans, the vast inertia that characterized Japanese officialdom during and immediately after the catastrophe, the passive and uncritical attitude of the unharmed and untouched masses outside of the devastated area. There were many acts of spontaneous kindness on the part of the Japanese, there were incidents of large crowds meeting the early refugee trains with food and other supplies, but organized effort was slow in making its appearance. A somewhat timid individualism governed the first manifestations of the desire to aid sufferers. There was much evidence of fatalistic acceptance of the calamity and a waiting on the part of the people and subordinate officials to be told what to do, and meanwhile not to do anything, or at least not to do too much. Thus was there everywhere evident the outstanding fact that the Japanese have adopted but have not absorbed our civilization.

They have knowledge of our modern methods of organization and administration, without a comprehension of the underlying principles upon which the methods rest. In their conduct toward outsiders and toward our civilization, they are governed by a set of rules or a code more or less perfectly memorized. The ideas of the Occident they have learned as a child learns his lessons; the ideals they have little or no comprehension of, or are altogether unconscious of. Our civilization clothes them as a garment. It does not pervade their consciousness as a basis of living, of conducting life. Therefore they are incapable of being stripped of this civilization in whole or in part by any catastrophic event. Such a thing happened in Tokyo and Yokohama and there was reversion to type in innumerable instances. Accepted rules did not work. There followed a stupid adherence to rules in spite of their unworkableness; or a relapse to oriental individualism without initiative, except the selfish initiative that concerns itself with one's own well being alone or that of immediate numbers of one's family. Foreigners became the barbarians they were in the early part of the last century, to be treated with hostility, or at least, suspicion. It was as though the great mass of the people close to the disaster were stripped of all pretense and driven back upon the only faith they knew. The gods had released the powers of evil. Why contend against fate? They would be told in due course what they must do, for in Tokyo there still rules the Emperor, the august son of Heaven. Naturally, not all were animated by the same feelings; naturally, too, the educated and the most highly responsible of her people recovered first; but it must always remain a fact, to be thought of as one may, that the net reaction of the Japanese in the first stages of the calamity that befell the nation in the Tokyo-Yokohama area was one of fatalistic stupor and almost total failure to view the catastrophe in the light in which

it appeared to white foreigners and consequently an incomprehensible unresponsiveness, a startling lack of initiative, and an utter inability to analyze foreign motives or to accept graciously and spontaneously the unqualified offers of immediate foreign aid.

JAPAN.

TOKYO AND YOKOHAMA AFTER THE GREAT EARTHQUAKE.

November, 1923.

I am not able to give any interesting and exciting personal earthquake experiences, for I left Tokyo on August 29 for the Nikko Mountains, and when the earthquake occurred on September 1 I was in a small mountain village 100 miles north of Tokyo and 10 miles from a railway. Here we had a very noticeable shake at two minutes of noon and a number of other shakes later on. These were not alarming in any way, for a resident of an earthquake country, and foreigners and natives alike supposed the shakes to be of local origin. The Japanese attributed them to the extinct volcano Shirani San about 10 miles away.

As soon as I learned of the disaster in the Tokyo-Yokohama area I walked to Nikko and after considerable difficulty obtained a Ford car and in company with the British military attaché proceeded to Tokyo with a full load of relief supplies.

No signs of earthquake damage could be seen until we arrived in a small village about 20 miles from Tokyo, where a few houses were slightly damaged. The next village, a mile or so nearer Tokyo, was completely down. The next practically undamaged. And so it went until we reached Tokyo, giving one the impression that the earthquake tremors had gone in waves. Later I learned that the amount of damage done was dependent not only upon the violence of the earth's motions, but the nature of the ground locally.

On the road we met thousands of Japanese carrying clothing and personal effects salvaged from the burning city, trudging back to the country—family, clan, and friends. The Japanese people are never very far removed from the soil, and even those in the industrial centers are easily absorbed back into country life, taking up easily and without undue hardship the work in rice paddies and mulberry fields. This greatly facilitated the solution of the refugee problem.

Going toward Tokyo was an equally large stream of men, many of them carrying rice or other relief supplies and others going to look for family or friends or impelled only by curiosity. The confusion on the road was indescribable, for the Japanese normally know but little of traffic control, and in a time of excitement such

as this was pedestrians, rickshas, bicycles, hand carts, horse carts and automobiles were mixed up in a hopeless jumble. If a man wanted to feed his horse he stopped, like as not in the middle of the road, and proceeded to feed him. Others went around him as best they could. If a man tired of carrying his bundle he put it down for a rest where he happened to be, regardless of others. During all this confusion it was truly remarkable how uncomplaining, courteous and patient the Japanese were.

The first suburb that we reached in Tokyo showed very little damage. Life seemed to be going on almost in a normal way except for the enormous number of people walking the streets and all of the street cars standing empty and deserted, as they had been stopped at two minutes of noon on September 1. Then we rounded a corner and as far as I could see there was desolation complete. Not a house was left standing. There are no words to describe it, for there was nothing to describe except débris and ashes, ashes and débris, for mile after mile. One could walk through the heart of Tokyo for 8 miles in almost a straight line without getting out of the area completely destroyed by fire.

In Tokyo, while most of the buildings were damaged more or less seriously by the earthquake, comparatively few were actually shaken down. Enormous loss of life and property was due to fires, about 150 of which started within a few minutes. Two-thirds of the area of a city of about two and one-quarter million inhabitants was completely swept by fire.

The Japanese are quite accustomed to disastrous fires. When one occurs the people hurriedly catch up a few quilts and small personal effects and hurry to the nearest open space. In Honjo, a densely populated district of Tokyo, the people with their personal effects crowded into a large open space until there was literally not a square foot left unoccupied. The fire came up on all four sides, sparks and burning embers fell in the open space and set fire to the clothing and effects of the people crowded there. In this one spot 32,000 lives were lost. The only ones who escaped were those protected by the corpses resting on them. Of course, it was quite impracticable to bury the large number of dead and they were generally disposed of as expeditiously as possible by cremation.

The shake in Tokyo was quite severe enough to show up dishonest building construction. Where a contractor had skimped his material in quality or size the result was disastrous. Steel and concrete buildings seemed to stand up the best when honestly built.

One frequently hears it stated that each country develops the type of architecture best suited to its own particular requirements. It was thought that the light, low buildings of Japan were especially adapted to withstand earthquake shocks. This proved not to be the

case. Generally, on Japanese buildings with light uprights and flimsy sides very heavy roofs were placed of thick tiles or of straw a foot or more in thickness. When the shock came the roofs of these buildings crashed to the ground, wrecking buildings and killing many people. Fortunately, there was a preliminary shock of 13 seconds preceding the first very severe shock and many people escaped from houses before the houses actually fell.

In Yokohama the shock was far greater than in Tokyo. Here a city of nearly 450,000 inhabitants was practically wiped out within 60 seconds. Four, five, and six story buildings, as well as smaller ones, crashed to the ground, a mass of broken wreckage. Some days after the disaster I stood on a mound in the grounds where our naval hospital at Yokohama had stood. On the bluff where hundreds of beautiful residences had stood not one building remained standing. The business section below and along the waterfront was covered with a tangled mass of wreckage and débris, with a few buildings standing in the distance about 2 miles away. In the streets were cracks 5 or 6 feet wide. In some places the surface of the ground had sunk 5 or 6 feet and in others it had apparently been forced up by pressure from below. Car tracks were bent and twisted. Bridges were down. Electric wires and poles were down, and so complete was the desolation that it was with the greatest difficulty that one could locate even the approximate site of a former well-known building.

If from Yokohama in the center a circle be drawn with a radius of 40 or 50 miles, it will include practically all the damage done by the earthquake. In this area towns and villages were damaged and many lives were lost. In the Hakone-Miyanoshita district large changes occurred in the contour of the land. Hill sides slid off into the valleys, taking villages, roads and the handiwork of man with them, and some points of land rose 6 or 8 feet. The most reliable estimates place the total loss of life in this area at between three and four hundred thousand and the property loss at between five and six billion dollars gold. Thus it will be seen that in this disaster Japan suffered a far greater loss in lives and money value than she sustained during the entire Russo-Japanese War. When one stops to think that in the San Francisco earthquake only about 300 lives were lost the extent of the Japanese disaster may be realized.

The Japanese naval losses are still somewhat shrouded in the usual oriental veil of secrecy. The Ministry of Marine has stated that their fleet sustained practically no damage. We know that the Yokosuka Naval Station near the entrance to Tokyo Bay was practically destroyed. Reserve fuel oil stored in subterranean reservoirs was lost in amounts variously estimated at between 150,000 and 500,000 tons. The *Amagi*, ex-battle cruiser, being converted into an

airplane carrier, was thrown over on the building way and wrecked. The *Naka*, a light cruiser building at the Yokohama Dockyard, was similarly wrecked. Persistent rumor has it that a large number of destroyers and submarines were lost at Yokosuka, despite the statement of the Ministry of Marine. In Tokyo the Naval Research Laboratory, the Hydrographic Office, War College, and naval technical schools were destroyed. The most serious blow, however, in a naval way, at least until it can be rebuilt, seems to have been the total loss of the naval powder factory. In Japan there are no privately owned powder works.

The reaction of the Japanese to the catastrophe showed nothing new to one who has studied the Japanese character. One would expect them to react rather slowly, but when they again took hold, to do very well except for an absence of initiative and the leaving of certain gaps which we would consider of great importance. This was the case.

In forming his opinion one should not fail to realize both the enormity of the disaster and the fact that it occurred at a particularly unfortunate time for the Japanese. A new cabinet was in the process of formation and it was several days before the members of the cabinet could be assembled for a meeting to formulate policy and issue instructions. During this time very little was done to restore order, relieve suffering, and direct life back into the normal channels. The central police stations in both Tokyo and Yokohama were destroyed. Consequently orders to substations were not given, and in the absence of such orders the police generally carried on only routine duties. The criminal element, as would be the case in any country, were prompt to take advantage of the situation. In Yokohama particularly there seems to have been, even from the first afternoon, a considerable amount of looting, robbery, and pillage. Martial law was not declared until September 4, but after the army assumed control order was restored very promptly.

Individual policemen remained on duty faithfully for hour after hour until many of them dropped from exhaustion, but they performed only the routine duties of policemen.

In the harbor of Yokohama, among other passenger ships, was the *Korea Maru*, belonging to the Toyo Kaisen Kaisha. While foreign ships were busily engaged in rescuing people in their boats and receiving hundreds of refugees, Japanese and foreign, as they came, the *Korea Maru*, I am reliably informed, hoisted her gangway ladders and refused to receive any refugees. Next morning about 11 o'clock the Ministry of Marine radioed the captain and informed him officially that there had been an earthquake and fire and asked his assistance in succoring refugees. Having been officially notified in a proper way the captain then willingly assisted.

During these first days after the earthquake the Japanese Navy itself seemed paralyzed as far as ability to do things is concerned. Their ships steamed aimlessly about, apparently without mission. Perhaps the navy was harder hit than the authorities have so far seen fit to acknowledge.

I do not mean to infer that there were not many individual instances of initiative and also of heroic conduct not under direction, but in almost all such cases they were on account of family or personal friends. As a class the servants in Japan, both those in foreign and Japanese homes, showed the greatest loyalty and heroism. The children in the care of Japanese ahmas (nurses) received the most self-sacrificing devotion, and many of them owe their lives to this devotion. This illustrates another well-known characteristic of the Japanese, which is an utter lack of understanding of the appeal of humanity. To family, clan, and personal friend in distress or danger they respond promptly and fully, but to any other human being not at all. They do not even understand what we mean by the appeal of humanity.

The day after the earthquake, while Tokyo was still burning, peculiar waves of mental aberration spread through the city and far into the quiet country outside the area of destruction. How these waves originated, increased, and traveled is a fit subject for the student of mass psychology under strain. The cry arose "The Koreans are coming! The Chinese are coming! Now that we are in the throes of disaster all the enemies of Japan are organized to destroy us." In the whole of Japan there were only a few thousand Koreans and Chinese, but yet the Japanese seem to feel that these were so well and efficiently organized and connected up with the Japanese socialistic element that they could function against the Japanese Government at a time when the Japanese Government itself was practically paralyzed as a result of the chaos and confusion.

In the towns of Japan, as well as in the cities, the young men are organized into various societies. They were converted into vigilance committees, with very disastrous results in many cases. Hundreds of Koreans, Chinese, and even Japanese suspected of socialistic tendencies were killed by these vigilance committees, animated no doubt by what they thought to be the highest patriotic motives.

From a mob insane with fury or apprehension no reason or reasonableness is expected, but in this instance most of those murdered were taken from the custody of the police by the vigilance committees and butchered on the spot. The largest number in one lot, of which I heard, was 86 Koreans under escort, well outside of Tokyo, where there are no signs of earthquake damage, proceeding in a quiet

and orderly manner as directed. The vigilance committee of a town on the line of march demanded that they be turned over. Result: All were killed.

In some cases the police refused to surender their prisoners and were themselves badly beaten. The insane idea seemed to be that anyone who would protect a Korean or socialist became thereby the enemy of Japan.

Incidentally this form of hysteria shows how deep-seated is the fear of socialism in Japan. The Japanese feel that the mildest form of socialism strikes at the roots of their form of government, and at all times the power of the Government is directed toward the forcible suppression of the very seeds of socialism.

On September 16 (more than two weeks after the earthquake) Captain Amakasu, of the regular army, then in command of a martial-law district in Tokyo, had one Sakae, a prominent socialist, arrested, along with his common-law wife, Ito Noe, also a prominent socialist, and her 7-year-old nephew. That night Captain Amakasu, in uniform and in the presence of some of his noncommissioned officers and privates in the station house under his command, personally with his own hands strangled these persons, man, woman, and child, one by one. The bodies were then thrown into a disused well. The facts came out about a month later and the captain has been court-martialed. The most astounding feature is that the people and press of Japan apparently very largely condoned these crimes, because Captain Amakasu stated that he did not do them as an army officer, but as a patriotic Japanese citizen, as he believed that when martial law was raised in Tokyo they would stir up trouble for the Japanese Government. Press and people had some difficulty in explaining satisfactorily the murder of the 7-year-old socialist, but apparently were willing to swallow the lesser dereliction in the greater acts of patriotic ardor.[1]

After the first few days the authorities and people began to recover from the shell shock and affairs were handled efficiently and expeditiously with one very serious exception. The authorities failed completely to realize the importance of communications in modern life and how important a bearing communications had in the effort to return to the normal in the area of destruction. Telegraph, telephones, country roads, postal facilities, radio, and railways all seemed to have been seriously neglected. Trains were not run into even the main station on the north side of Tokyo until 28 days after the earthquake. The main line from Yokohama to Kobe, via the

[1] NOTE.—It is understood that the sentence of the court-martial of Captain Amakasu was imprisonment for 10 years. If this is correct it is not believed that he will serve anything like that length of time.

large industrial centers of Nagoya and Osaka were not in commission to run through trains for about seven weeks. Telegrams to and from the devastated region were subject to days of delay and for weeks in this region telegraphs and telephones were practically nonexistent. Even outside of the Yokohama–Tokyo area the mails seemed to have been violently disarranged on account of the trouble in Tokyo. The resulting confusion, extra work, unnecessary travel, mental anguish, and delay in getting back to normal can be imagined better than described. This failure on the part of the Japanese to realize the vital importance of communications is thought to be one of the most important lessons for us to learn from the disaster.

The termination of the various periods in the development of Japan in modern times has almost always been definitely marked. (1) The early treaty between Japan and America definitely ended the period of isolation; (2) the restoration definitely ended the rule of the Shoguns; (3) the treaty of Shimonosaki definitely made of Japan a world power; (4) the treaty of Portsmouth definitely made Japan a first-class world power; (5) in no less definite a way the great earthquake terminated the era of predominent economic influence of foreign residents in Japan in certain lines, and henceforth Japan will be more completely on her own economically than ever before.

One of the most important developments in Japan in recent years has been the progressively increased influence of big business in the Government. The days have passed when the navy and army and their clans can lay down the big policies of the Government. The voice of big business now speaks with authority, though not always heard in the open. In Japan the real big business is largely in the hands of half a dozen big families—Mitsui, Shibusawa, Iwasaki, Okura, Asano, Matsukata, and their relatives, direct and collateral, natural and adopted. Of course, the increased power of these families will have an enormous influence on the future of Japan, economically and politically, in both foreign and domestic relations, but space does not permit of its discussion here, though it is full of interest.

Japanese big business interests have for some years been working to eliminate or materially curtail the economic importance of the old established foreign firms, and the disaster of September 1 made too good an opportunity to be neglected. The handwriting on the wall was apparent as soon as the Government began to function a few days after the earthquake. Government control of certain lines of import, censorship of business telegrams, both incoming and outgoing, building restrictions, chambers of commerce rulings, all show the trend.

The question of perpetual lease property in Yokohama has long been a tender spot to the Japanese. I have been informed, though I can not vouch for its truthfulness, that every foreign safe in Yokohama containing a perpetual lease was entered by unauthorized persons within a few days after the earthquake and the leases disappeared. The foreigner will probably find it more profitable to dispose of his claim to a perpetual lease to the Japanese Government than to fight his claim through the Japanese courts.

Big business working with the Government is out to eliminate its foreign rival. "The business of Japan for the Japanese," is the motto of the day, and the handicap on the foreigner will be too heavy to overcome. The object to be obtained is, of course, a natural and understandable one, but the methods used are sometimes far from commendable. Illustrations could be given in numbers, but they serve no useful purpose. I believe that I may state with confidence that noon September 1, 1923, marked the end of the great economic influence of the foreign business man in Japan.

It has been often stated that the generous sympathy and aid of America for Japan in her hour of trial has definitely put an end to the possibility of any serious conflict between the two countries. Of course we know that the earthquake and fire and our resulting generosity did not eliminate any conflict of interest between Japan and America. Quite the contrary. That we were able to act so promptly, efficiently, and generally, aroused not only the gratitude of the Japanese, but their envy and jealousy as well. I know the Japanese well enough to state without fear of successful contradiction that their envy and jealousy will long outlive their gratitude.

For a few years Japan will be laboring under a severe handicap and therefore all the more ready to seize an advantage, real or fancied.

I think there is no doubt but that the governing class in Japan is sincerely convinced, aside from questions of sentiment or gratitude, that the interest of Japan will be best served in the discernible future by the friendship and cooperation of America. At the same time she is in no danger of being diverted from her course by high-sounding platitudes nor weak-kneed mushiness. Our every act, in the Far East particularly, is scrutinized closely both as to result and motive, and the moment that Japan decides her interests—even of the moment, if they are large enough—are not served by our friendship, then friendship and gratitude will go by the board, for Japan is first, last and all the time solely for Japan.

GERMANY.

AIRSHIPS IN THE WORLD WAR.

The following article was prepared by Lieutenant von Schiller, now employed by the Zeppelin Co.:

Lieutenant von Schiller belonged to the regular German naval establishment and was commissioned a lieutenant in 1914. He was one of the first officers to volunteer for the naval airship service, and during the war served on the following rigid airships: *L–6*, *L–11*, *L–25*, *L–30*, *L–54*, and *L–72*. On most of these ships he was the executive officer, the commanding officer being Bottlar, probably the most famous and successful of all German airship pilots. Von Schiller, however, commanded the *L–72*, the last rigid airship constructed for the navy.

Lieutenant von Schiller has written several articles for the technical press in Germany, one of the most interesting appearing in the "Marine Rundschau" of March, April, 1922.

The present article was written after a study of the admiralty war records, and was approved by the German Admiralty on condition that it be considered confidential by our Navy Department and not given out for publication. It is considered to be an accurate record of the German Naval Airship Service during the World War.

The accompanying charts are valuable and include, among others, the distribution of airships on the 31st of May, 1916, and 1st of June, 1916 (Battle of Jutland), and at the time of the engagement between the British and German forces on the 19th of August, 1916.

THE ACHIEVEMENTS OF GERMAN AIRSHIPS IN THE WORLD WAR.

By Kapt. Lt. von Schiller.

When the World War broke out in 1914 German aviation was still in its infancy. Experiments with airships had been made by the army, the German Airship Co., in conjunction with the army and the navy; and after 1912 by the navy itself. But they did not even approximately fulfill the demands of naval warfare. The navy especially can be said to have totally lacked experience in the use of airships in naval warfare. A working basis had therefore to be found.

The results of the fall maneuvers of 1912 and the circumstances leading to the loss of the *L-1* had convinced the imperial navy that larger and more serviceable types of airships would have to be built in order to fulfill the demands put upon them, and plans for a 32,000 cubic meter ship were evolved.

In order to have a sufficient number of trained men, a regular army airship was ordered in the spring of 1914, and this airship, *L-3*, was the only naval airship available at the outbreak of the war. Pending the completion of the large type of airship and urged by the necessity of war, several more army ships were built for the navy.

As far as their size permitted they proved completely satisfactory from a military point of view, and were even used for raiding although here they were sometimes the victim of their own deficiency in size and power of resistance. Due to the inefficiency of the early radio sets communication was difficult and unsatisfactory and oftentimes messages were so delayed by material troubles that they arrived too late to be of value.

On account of the importance of the regular naval information demanded and due to material limitations, both as regarded quantity and quality, the airships were not permitted to execute raids upon England save under the most favorable meteorological conditions. However, on the other hand, all available naval airships were constantly occupied in an extensive observation service, which of course was not widely advertised at the time.

The military appreciation of the importance of the airship, which formed an arm offsetting in a measure the numerical inferiority of the German Navy, was increased when two skirmishes, on the 28th of August, 1914, and on the 25th of January, 1915, ended unfavorably, and resulted in the loss of one large and three small cruisers because the air service which should have reported the enemy's raid was either entirely negligent or else failed owing to an insufficient number of airships.

However, conditions were greatly improved in the second half of the year 1915, when a sufficient number of airships of 32,000 cubic meter type were completed to satisfy the normal demands of scouting and raiding. Their capacity as well as their speed enabled the Zeppelins to extend their flights to the English and Scotch coasts, even in less favorable weather. The wireless had improved so much that it rarely failed, and owing to the larger useful load of these ships, the armament had been perfected, and bombs and machine guns in sufficient quantities could be carried.

The mine-sweeping service was almost entirely guarded by airships so that outside of the mine sweepers only a few surface and subsurface craft had to be used. Occasionally the Zeppelins themselves were used as mine searchers and in this capacity they found and marked a number of enemy mines unknown till then.

At the end of the year 1915 a still more serviceable type with 55,000 cubic meters capacity had been ordered and the newer models of the 32,000 cubic meter type were lengthened by 15 meters. This prevented an interruption in the delivery and was moreover a slight advance in the art. *L–3*, a 55,000 cubic meter type, reached a height of 4,500 meters, and later ships of this type greatly surpassed this achievement. Shortly before the end of the war the same type of airship was improved so that it fulfilled the ever increasing demands, such that the daily scouting trips could be undertaken without fear of great losses.

It is mentioned, among other incidents, that for six weeks, from May until June, 1918, at least three airships were uninterruptedly patrolling the North Sea, relieving one another morning or evening and flying from the coast of Norway to Scotland and into the English Channel, thus preventing the English fleet from approaching the German coast unseen.

The course of scouting service was such that the airships described a circle, the approximate center of which was Heligoland. In this way one ship patrolled to the north from Lynwyk to the Doggerbank north, the second over Doggerbank proper, and the third ship from Doggerbank south to Terschelling. Moreover, every night at least one airship undertook a raid into the mined area to observe the merchant traffic in the neutral channel and a flight to the Skagerrak in the north for the same purpose.

The patrolling of the Baltic Sea remained almost the same during the whole war as far as offense and defense were concerned.

In the year 1914 Kiel and in some cases Fuhlsbuttel were available as ports of departure. From Kiel small Parseval ships did service over the Danish belt, until at the beginning of 1915 the *M–4* came to relieve them. For especially long trips the Zeppelins stationed at Fuhlsbuttel were used and after the end of 1915 *PL–25*, which was also stationed there.

In the eastern part of the Baltic Sea the harbor Seddin, near Stolp, in Pommern was completed in the middle of the year 1915, but this harbor lay too far to the west of the scene of operations and the capacity of the airships was not sufficient to permit operations from this station. Another base of operations was constructed in Wainpden in Kurland, but was not completed until 1916. As early as the middle of the year 1915 it became apparent that the Schutte-Lanz airships could not endure the dampness of the North Sea and that their general capacity was far behind that of the Zeppelins. They were therefore used in the Baltic Sea, where the Russians were not as actively on the defensive as the English in the North Sea. But even in the east the Schutte-Lanz ships were driven to their utmost by the long distances to be covered. Raids could be made but rarely and only under the best weather conditions. Toward the end of 1917 the capture of Osel Island in the Baltic, which was used as a base for operations against Reval, caused a greater activity in aviation. A few ships were taken over from the army, and at the close of the operations in the east against Russia they were withdrawn from active service, as their capacity was not sufficient for use in the North Sea.

Now that the reports of all the airships are at hand, it is easy to form an opinion of their flight activities.

One of the most important questions was the replacing and the training of men. In peace times a sufficient number of first-class men could be trained. The demands of warfare, however, and the drain made upon the men by the other special services, such as airplanes and submarines, did not permit a choice as strict as the best interests of the airship service demanded. Moreover, the state of war made necessary a much shorter period of training, which, of course, could not be as thorough as in times of peace. The disadvantages arising therefrom led to disorder and losses. Owing to the lack of experience in the tactics of scouting a number of mistakes and failures occurred in the course of the war, especially because the newly trained commanders were obliged to devote the greater part of their attention to the technicalities of airship handling and so negleced the military demands made upon them. Another fact which prevented the airship service from yielding the very best results was that many commanders lacked the necessary military schooling, so that they failed to comprehend how important for naval warfare was the correct execution of orders and allowed themselves to be sidetracked by secondary circumstances. The physical and technical demands of the service required young men, and it was also easier to train them rapidly. Older commanders lacked the necessary mental adaptability, and so the lesser evil of insufficient military schooling was chosen. Tactical training was utterly impossible owing to the war and the distance of the airship ports from one another. As an example of this lack of military training, on January 25, 1915, the crew of an airship became so interested in the sinking of the *Blucher* that it failed to observe what English forces participated and so it was not known that the *Lion* was damaged and towed in.

Very often a commander misjudged the importance of an operation and, detained by the undoubtedly captivating sight of a naval encounter with the enemy's forces, failed entirely to execute his orders. Too often they over-

rated bad weather, and often at a distance of only a few miles much better meteorological conditions prevailed, and if they had gone on would have been able to execute their mission.

Even now after studying the war diaries and reports it is not possible to form a correct opinion, but the thorough military schooling of some of the commanders is apparent. They grasped the importance of their orders and executed them correctly at all costs, under all sorts of unfavorable conditions even at the risk of losing the ship.

The naval leaders who, especially at the beginning of the war, were not in touch with the military casualties were unfortunately often influenced against the proper use of the airship service by the above-mentioned occurrences.

In his book "The High Sea Fleet," on page 267, Admiral Scheer writes: "The airship observation service was unfortunately of a negative character because the fleet was only informed of the fact that the enemy's main forces were not within the circles of observation, while it is much more important to know precisely where they were." Nevertheless during the course of the war the Zeppelins brought in much important information about the enemy, even outside of the circles of observation. When the fleet undertook an expedition it much preferred the help of the airship service, and sometimes the expeditions were not executed because of the lack of airships. The advantage held by the Germans by virtue of their airships was well known to the English. Admiral Jellicoe repeatedly refers to it in his book.

During such an expedition the fleet surrounded itself and the scene of operations with a ring of airships, whose formation was so arranged that it was almost impossible for enemy contingents to slip through.

During the course of the war the airship fulfilled a series of special services which shall be briefly mentioned here.

On December 25, 1914, the *L–5* on an observation trip discovered a few English seaplanes. The planes in the air managed to avoid *L–5*, which therefore turned its attention to those resting upon the water. While *L–5* was attacking the planes with machine guns, a submarine appeared, took the pilots of the planes on board, and dived before *L–5* could attack. The seaplanes were destroyed.

Battles between submarines and airships were frequently fought. On May 3, 1915, *L–9* came upon four English submarines that opened fire. *L–9* was able to drop a bomb and one submarine was destroyed.

On May 7, 1916, a small English cruiser shot down *L–7*. The surviving crew was picked up by an English submarine, made prisoners and taken to England.

During the year 1918 battles between airships and submarines occurred frequently. On May 6 *L–54* and on July 9 *L–63* reported attacks resulting in the probable sinking of the submarine. Often, too, the attempt was made to have airships and submarines cooperate. This was done by having the airships fly over waters patrolled by a submarine in the hope of decoying enemy surface craft.

The attempt to drop bombs on moving ships was rarely successful because the ships immediately adopted a zigzag course. The first attempt to drop a bomb on an enemy ship was made by *L–6* December 25, 1914, but the only bomb dropped struck about 50 meters from the target.

On August 19, 1916, *L–21* successfully attacked a destroyer and photographed the result of the action. In general the height from which the attacks were made was so great that the hitting of the target had to be left to fate.

When the German auxiliary cruiser *Meteor* was about to leave port *L–7* carried out an especially long observation trip on August 9 and 10, 1915, patrolling the outward course of the cruiser.

In April, 1917, the *L–23* sighted the Norwegian bark *Royal* and took possession of it by landing on the water and commandeering a cutter from the bark. Then a prize crew was sent on board the bark in the cutter. The cargo having been pronounced contraband the bark was brought to Cuxhaven.

During the same month a seaplane having been obliged to land on the water the *L–23* took off the crew and engine.

On February 8 of the winter 1916–17, *L–16* brought food and mail to the islands lying off the German coast, which had been cut off from the mainland by frost and bad weather.

The most important special service demanded of an airship during the war was the African flight of *L–59*.

Another main factor in the activities of the airships was the raids. As I have already written in the "Marine Rundschau," this was important from the point of view of morale as well as in a military way. For the development of airships themselves the attacks were of great value, for they brought a constant improvement in the height and speed of the flight. The energetic defense of the enemy demanded steady improvement in the ships and these improvements were effected by close cooperation of the builders and completely satisfied all demands for the ensuing time.

The type last evolved was sufficiently large for a more extensive scene of operations than the North Sea. The patrolling of the Atlantic with them would have been entirely possible.

The Battle of the Skagerrak, Jutland, and the Undertaking of the High Sea Fleet, August 19–20, 1916.

During the course of the war two undertakings of the fleet in which the airships took part were especially remarkable. As each of the two can serve as an example we will describe the battle of the Skagerrak and the undertaking of the 19–20 of August.

In the course of the first undertaking at Jutland the airships did not play any part and it might prove interesting to more closely examine the reasons for this.

As Admiral Scheer wrote in his book, pages 197, 198, the aim of the undertaking was the bombardment of the fortifications and defenses of the harbor of Sunderland. This order was given to the fleet on May 18. "Moreover an air service with the largest possible number of airships is counted upon. If airship scouting becomes impossible a new plan must be evolved by which the submarines can operate without the assistance of the air service."

From the 21 of May on the weather was exceedingly unfavorable, so that no airship could be permitted to take to the air.

"On May 30 when the possibility of a widely extended airship observation still seemed doubtful, I decided to proceed in the direction of the Skagerrak because the proximity of the Jutland coast afforded a certain protection against surprises. An airship scouting service would have been indispensable for the advance to the northwest toward Sunderland, for this was a region in which we could not possibly allow ourselves to be forced into a battle against our will. In the course now chosen the distance from the enemy's bases was much greater and so the airship service, while desirable, was not indispensable."

The orders issued for the expedition decided upon were as follows:

Order issued May 30 in the evening. Open Gg. 2490 to-morrow, First day.

See chart for May 31st. 1916.

First day.

(1) *L–14* as airship 1, takes off at 3 p. m. Direction over Hornsreef to the north to the line Hanstholm-Ryvingen. Then patrol in sight of the Norwegian coast to about Eckero, return from the northmost point at the latest at 6 p. m. (revolving aerodrome), (this order was originally meant for *L–17* (Hage), but the ship could not be taken out from the stationary aerodrome).

(2) *L–23* as airship 2, takes off 3 a. m. Direction north to west from Helgoland, no further than square 081g Zsz 4. Patrol between 08104 and 092. Return at the latest 6 p. m. (revolving aerodrome). (*L–11* originally had this order, but was unable to take off from the aerodrome at Hage.)

(3) *L–21* as airship 3, takes off 3.30 a. m. Direction northwest by north from Helgoland, no further than 092 g 3 patrol between 092 g 3 and 072 a 5. Return at the latest 7 p. m.

(4) *L–9* as airship 4, takes off 7 a. m. Direction northwest by west from Helgoland, no further than 072 a 5, then to 113 b 5. Return at the latest 5 p. m.

(5) *L–16* as airship, takes off 9 a. m. Direction west by north from Helgoland, no further than 113 b 5, then to 017 p 7. Return from there at the latest 6 p. m.

Signed: Strasser.

Orders issued May 31 in the evening. Open Gg. 2490 to-morrow, Second day.

See chart for June 1st. 1916.

(1) *L–24* as airship 1, takes off 12 a. m. over Hornsreef. Direction north into the line Hanstholm–Ryvingen, then patrol in sight of the Norwegian coast till about Eckero. Then return as rear guard. Land before dark. Report at 11.30 p. m. if ascent possible for two ships (*L–22* and *L–24*) from Tondern.

(2) *L–22* as airship 2, takes off 12.30 a. m. Direction north by west from Helgoland, no further than 081 l 4, then to 092 a 5, then return as side guard. Land before dark.

(3) *L–11* as airship 4, takes off 1.30 a. m. Direction northwest by west from Helgoland, no further than 072 a 5, then to 113 b 5, then return as side guard. Land before dark.

(5) *L–13* as airship 5, takes off 3.20 a. m. Direction west by north from Helgoland, no further than 113 b 5, then no further than 017 p 7, then return as side guard. Land before dark. If wind northerly take precaution not to drift too far south.

The high-sea fleet had left the harbor early in the morning of the 31st of May. Towards noon the weather improved somewhat and the wind died down so that a part of the airships could get out, so the commander of the airship division sent his ships out after the fleet, almost 12 hours late. On this occasion the advantages of the revolving aerodrome at Nordholz were proved. While the ships originally intended for the service and lying in the stationary aerodromes at Hage could not leave these, the airships in the revolving aerodrome could easily do so. Therefore *L–21* and *L–23* substituted for *L–17* and *L–11*. Somewhat later the other ships were able to take off from the stationary aerodromes (*L–14*, *L–9*, *L–16*). Hanstholm, the weather station situated nearest to the scene of battle, reported fog on the morning of the 31st, and the aviation stations along the German coast also reported mist and fog. The low position of the clouds was itself an unfavorable condition for air observation. The weather chart of two in the afternoon showed no marked im-

provement. Therefore on May 31 the Zeppelins *L–14* and *L–23*, flying comparatively close to the scene of battle, saw nothing of the enemy. According to the war diaries the reports of the ships themselves are as follows:

Airship 1, L–14.—At the beginning of the battle *L–14* located about 50 miles southeast from the head of the German fleet and therefore in the most favorable position against the enemy for the purpose of getting in touch with the enemy in a northerly direction—in order to convey to the German forces information of any newly added forces of the enemy. Owing to the low clouds and the atmosphere, *L–14*, however, passed over the scene of battle without being able to see anything. At 9.30 p. m. information received pointed to a southerly location of the German main forces, *L–14* therefore considered the original task completed. The neighboring ship *L–23* had been able in a manner to help fulfill the task owing to its more southerly position. In a southerly direction *L–14* therefore tried again to reach the presumable scene of battle but nothing was to be seen this time either. Obeying the commands of the marine division, *L–14* returned, but in order to fix the ship's position set course over Lynwick.

Airship 3, L–21.—At 5.30 in the afternoon, location about 50 miles southeast from scouting force, *L–21* decided to continue on its course. Firstly, because *L–14* and *L–23* were nearer to the main German forces; secondly, because *L–9* had been put out of commission by a broken propeller shaft; and lastly, because by continuing in its course it would stand to the west of the enemy's lines and therefore be in a position to report the arrival of any new forces of the enemy. After completing this task *L–21* returned without having sighted the enemy. The general visibility was very bad; the best visibility is reported to have been at 6 p. m.

Airship 4, L–9.—L–9 was put out of commission at the beginning of the battle by damage to a propeller shaft.

Airship 5, L–16.—L–16 was able to patrol to the west according to orders. The enemy was not to be seen.

During the second day of the undertaking, the first of June, the airships were able to conduct their service according to plan. In the war diaries the airships report about as follows:

Airship 1, L–24.—Took off from Tondern 11.50 a. m. At 2.10 a. m. observed gunfire near Hornsreef. The visibility was therefore evidently better at times than the day before. At 3.03 a. m., *L–24*, after having passed over the German main forces, was violently but ineffectively shot at by enemy forces. From 3.45 to 4.05 *L–24* again engaged in battle with light cruisers, evidently rear guard of the enemy. *L–24* dropped bombs but unfortunately without effect. In the vicinity of Skagen, owing to the clear atmosphere, an enemy contingency of at least 12 large battleships and numerous cruisers was sighted from a height of 2,200 meters. This contingent was pursuing the airship south, in line formation, with the cruisers in advance, and was moving to the south, while at the moment of sighting it had been lying still. *L–24* moved out of range of the shots by rising into the clouds. At 6.45 the ship again came upon enemy forces that shot at it and attempted to drive it away. At 7 a. m. the German fleet lay to the south of Hornsreef and therefore the task of *L–24* was accomplished.

Airship 2, L–22.—L–22 also took off from Tondern and shortly before 3 a. m. sighted gunfire and searchlights ahead. Visibility was comparatively good (10 miles) but lying near its own main forces, *L–22* could see nothing of the enemy. At 4 a. m. flashlight and explosions were reported ahead and to starboard, probably the engagement of *L–24*, and the dropping of bombs. At 5 a. m. the wind rose considerably and the commander considered it wiser to undertake the rear guard of the fleet immediately instead of running further

to the north as originally planned. When the fleet dismissed the airships the return was made on the same course.

Airship 3, L–17.—At 4 a. m. *L–17* was already far to the rear of the fleet and therefore turned and flew to the south parallel to the fleet as wing guard. Nothing was sighted beyond a German searching force at work, and at 5 a. m. a return was made in order to approach the German main forces again. After another expedition to the northwest, conducted in a zigzag course, the return was effected from Hornsreef at 7.43 a. m.

Airship 4, L–11.—At 5 a. m. *L–11* was diverted from its original intentions by the sighting of the main force of the enemy. In quick succession three large enemy contingents were reported by *L–11* (according to Jellicoe's report the "Battle cruiser, light fleet and light cruiser" which parallel to each other had, since the evening before, preceded the German fleet in a southerly direction without, however, sighting it). During the observation the enemy turned to the west and began violently shooting at the airship. *L–11* remained in touch with the enemy until 6.20 a. m., but could not, owing to the low position of the clouds, remain in touch with the enemy any longer. As far as could be judged the enemy sustained no serious damage. It ran in good formation and at high speed so that *L–11* judged that new forces and not the same as those in the battle of the day before were being dealt with.

Airship 5, L–13.—As on the previous day nothing of the enemy was to be perceived in the west. The locations chosen by the airships were all almost too far west as could be seen from a comparison of the location of German forces and the English fleet. The visibility from the height of flight was at times very bad, the strength of the wind increased and freshened up considerably in the north, so that an exact fix was not possible; also it was only possible to send through the most necessary weather information because of the radio limitations required for the night battles and the retirement. The easterly drift was already noticed during the trip of *L–11*, which reported it in the diary. In the same way the location of *L–17* at 4.12 in comparison to the location determined by the position of the mine-searching force at 5 a. m. the ship sighted the engagement and the bombs dropped by *L–24* while her assumed position was much farther to the west. *L–24* seems to have determined a better position, for it was occasionally able to locate its position by objects on shore. Owing to the execution of the plans according to those laid down for the airship scouting service for the first of June, the different airships were able to hand in better reports. Especially the report of *L–11* was of great importance.

The failure of the airship scouting service on the previous day was therefore caused, first, because the ships were unable to leave their aerodromes at the proper time and therefore reached the enemy many hours too late. Added to this was the misty atmosphere and the low position of the clouds. In general, a region like the North Sea, with its unfavorable meteorological conditions, seems very unsuited to the conducting of a war with airships. The bad weather coming from England continued in the "Wet Triangle" near the English Channel, and for the Germans there was the added disadvantage of receiving no weather communications from England. In spite of this, during the whole war the Zeppelins fulfilled the demands made upon them so well that it was practically impossible for the English to approach the German coast unseen. By their expeditions, numbering over a thousand, they earned the name of "the eyes of the fleet." In the battle of the Skagerrak, Jutland, we can see the example of an airship scouting service, planned to advance, to the north but having one flank protected by the coast. But in the expedition of the 19th of August we see an example of an airship scouting service surrounding the

whole of the advancing fleet. Owing, however, to an unfortunate combination of circumstances the expedition took an entirely different course from the one planned.

See chart for August 19th, 1916.

Airships surrounded the advancing fleet so that an unnoticed approach of the English was practically impossible, given normal visibility conditions. At 12 a. m. all the airships had reached areas and were patrolling according to orders. The fleet itself, accompanied by an airship of its own located near the scout commander, advanced towards the Tyne. During the course of the morning *L–13* had sighted two destroyer flotillas of the enemy with cruisers in the rear, to the eastward of the English Channel. The whole force was running into the channel at high speed. From the same region toward 11 o'clock *L–13* reported a small cruiser with course east–northeast. *L–31* located before the Tyne reported two small cruisers and several destroyers. As the German submarines had also reported enemy forces, the German fleet counted with the presence of a large enemy force. Therefore, when at about 1.30 *L–13* again came upon the enemy and reported about 30 units, destroyers, large and small cruisers, and battleships proceeding on course northeast, the naval leader, at 2.30 decided to alter his course and turned towards the enemy lying to the south of the fleet. At the same time *L–21* had a running skirmish with destroyers and dropped bombs upon them with good results while an enemy aeroplane crossing the course of the airship made a futile attempt to drop bombs on her. *L–21* was able to photograph the splashes of the seaplane's bombs in the water. Meanwhile the favorable weather of the early morning gave place to rain and hail storms. Low hanging clouds very often prevented flight in the lower clouds regions. Therefore *L–13* after being violently shot at by the enemy lost track of these forces and was not able to regain touch with it. At 3.30 a wireless from *U–53* reported another enemy force to the north of the fleet. *L–31* immediately proceeded to the place reported, sighted the enemy and was able to communicate with the fleet, but it was too late to change the course of the main German fleet to face the enemy in the north. *L–31* remained in touch with the enemy until 6 o'clock and then as the fleet having vainly attempted to reach the enemy in the south, returned to port, she flew as wing guard for the fleet. *L–11* also succeeded in sighting the English reported by *U–53* and *L–31* and on the retirement of the fleet, *L–11* undertook the covering of the right wing, and in this capacity *L–11* again met light English cruisers and destroyers which followed the fleet out of range, until at about 9 p. m. they took a southerly course and disappeared. *L–21* caught a short glimpse of the same forces at about the same time but lost sight of them in the darkness. The fleet was able to see the enemy forces following, but at too great a distance for artillery attack. All together on this day the airships brought in a number of reports about the enemy, which materially influenced the plans of the fleet. The fact that the attempt was made to reach the enemy in the south, when, by keeping to the original course the enemy would have been met in the north, was an unfortunate occurrence which could not have been foreseen.

LIST OF ALL THE AIRSHIPS IN SERVICE IN THE NAVY.

L–3.—Was in service at the outbreak of war; destroyed 17–2–15. Commander, Lt. Capt. Fritz. Chief Off., Freiherr v. Buttlar until 10–14, then Freiherr v. Lyncker. Flights war, 31; 1 successful raid. Sum of all trips, 88. Fate: Was stranded on the coast of Denmark and destroyed by the crew because it could not reach home owing to lack of benzene.

L–4.—Placed in service 30–8–14; destroyed 17–2–15. Commander, Lt. Capt. Count Platen Hallermund. Chief Off., Oblt z. S. Petesen, then Oblt. z. S.

Kruse. Flights of war, 12; raids, 1. Sum of all flights, 40. Fate: The same as *L–3*.

L–5.—Placed in service 24–9–14; destroyed 6–8–15. Commander, Oblt. z. S. Hirsch; from 4–15, Böcker; from 7–15, Ehrlich. Chief Off., Wenke; from 4–15, Frankenberg; from 7–15, Dietsch. Flights war, 44; raids, 2. Sum of all flights, 95. Fate: Heavily damaged after raid on Dünamund, obliged to land by Plungyani, and dismantled on the spot, as was old model anyway.

L–6.—Placed in service 3–11–14; placed out of commission 19–9–16. Commander, Freiherr v. Buttlar, from 5–15; Breithaupt, from 8–15, training ship. Chief Off., v. Schiller, from 5–15; Kühne, from 8–15. Flights war, 47; raids, 1. Sum of flights until was used as training ship, 90. Fate: Burned in the aerodrome in Fuhlsbüttel owing to mismanagement of the gas supply apparatus.

L–7.—Placed in service 22–11–14; placed out of commission 4–5–16. Commander, Petersen; from 6–15, Dietrich; from 2–9, Stabbert; from 9, v. Schu-

L–3.—Type, L 3 to 8, 5 ships; capacity, 22,470 cu. m.; length, 158 m.; diameter, 14.9 m.; useful load, 9,200 kg.; no. of gas cells, 18; no. and power of engines, 3—180 h. p.; speed, 23.4 m. p. s.; construction, 1914 to beginning 1915.

bert. Chief Off., Brodrück; from 6–5, v. Nathusius; from 2–9, Schirlitz; from 9, Rothe; from 1–16, Sommerfeld, Gebouer; from 4–16, Hempel, Wenke. Flights war, 77; raids, 0. Sum of all flights, 165. Fate: Shot down by artillery of light cruisers. Was surprised.

L–8.—Placed in service 18–12–14; placed out of commission, 4–3–15. Commander, Beelitz. Chief Off., Kühne. Flights war, 1; raids, 0. Sum of all flights, 21. Fate: Having crossed the line with too little height, was shot, badly damaged and landed by Tirlemont. Was demolished.

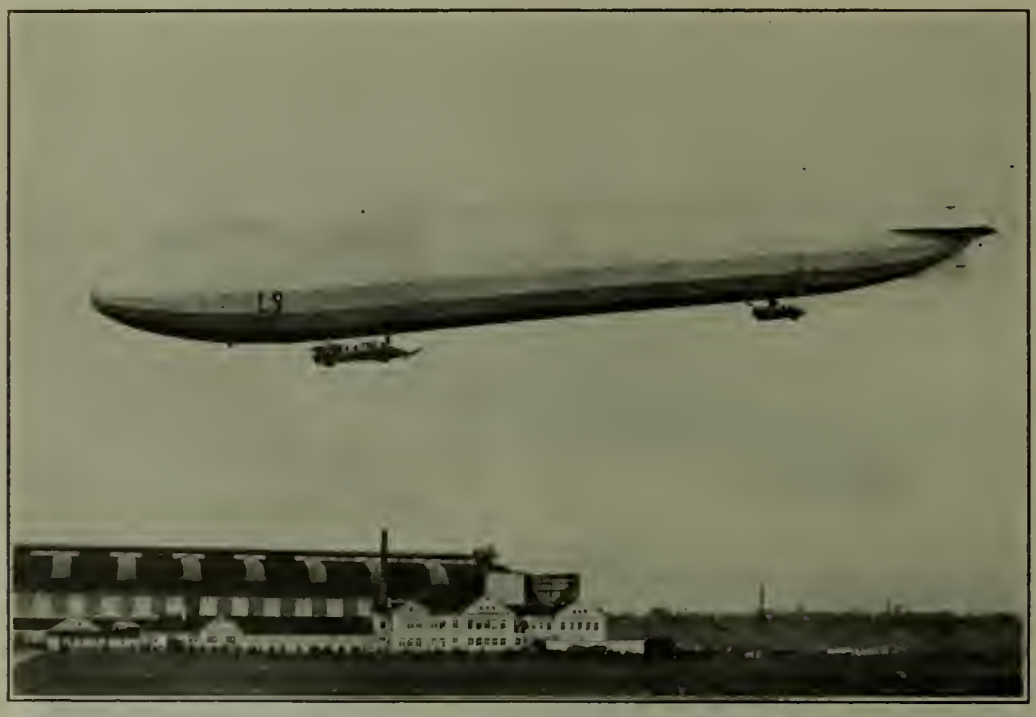
L–9.—Placed in service 8–3–15; placed out of commission 19–9–16. Commander, Mathy; from 7–15, Löwe; from 9, Dietrich; from 2–16, Prölss. Chief Off., Friemel; from 7–15, Braunhof; from 9, v. Nathusius; from 2–16, Brand; from 4–16, Stelling, Schütz; from 6, Kranshaar, Zimmermann; from 7, Ganzel,

Rothe; from 16–9, training ship. Flights war, 75; raids, 0. Sum of all flights, 140. Fate: The same as *L–6*.

L–10.—Placed in service 13–5–15; placed out of commission 3–9–15. Commander, Hirsch; from July to the end of August, Wenke, then Hirsch. Chief. Off., Wenke; from July to the end of August, Sticker, then Sticker. Flights war, 8; raids, 5. Sum of all flights, 29. Fate: Was struck by lightning and burned owing to strong valving during a storm.

L–11.—Placed in service 7–6–15; placed out of commission 5–4–17. Commander, Freiherr v. Buttlar. v. Schiller; from 2–16, Schütze, Mieth; from 25–9, school ship. Flights war, 54; raids, 12. Sum (inclusive school trips), 394. Fate: Dismantled in Hage, as was old model.

L–12.—Placed in service 21–6–15; placed out of commission 10–8–15. Commander, Peterson. Chief Off., Brodrück. Flights war 6; raids, 1; total, 14.



L–9.—Type, L–9, 1 ship; capacity, 24,900 cu. m.: length, 161.4 m.; diameter, 16 m.; useful load, 11,100 kg.; no. of gas cells, 15; no. and power of motors, 4—240 h. p.; speed, 23.6 m. p. s.; construction year, 1915.

Fate: Was badly-damaged during attack on Harwich; landed on the sea and was towed to Ostend by German torpedo boat and there dismantled.

L–13.—Placed in service 23–7–15; placed out of commission 30–4–17. Commander, Mathy; from 5–16, Prölss; from 10, Eichler; 1–17, Schwonder; 21–2–17, Fleming. Chief Off., Friemel; from 5–16, Brand; from 10, Kohlhoner. Flights war, 45; raids, 10; total, 160. Fate: Dismantled in Hage, as was old model.

L–14.—Placed in service 9–8–15; placed out of commission, 8–9–8. Commandant, Böcker; from 6–16, Manger; from 5–12, Dose; from 6–4–17, training ship. Chief Off., Franckenberg; from 6–16, Grumer; from 5–12, Trube. Flights war, 57; raids, 15; total (inclusive school trips), 526. Placed out of commission at the time of the revolution and then demolished.

L–15.—Placed in service 9–9–15; placed out of commission 1–4–16. Commander, Breithaupt. Chief Off., Kühne. Flights war, 11; raids, 3; total, 35. Fate: Was badly damaged by artillery, landed on the Thames and was captured by the English. The ship broke into pieces in the attempt to tow her in.

L–16.—Placed in service 23–9–15; placed out of commission 19–10–17. Commander, Peterseon; from 29–5, Sommerfeldt; 14–11–16, Gayer; 10–3, training ship. Chief Off., Brodrück; from 29–5, Gebauer; 14–11–16, Dehn. Flights war, 50; raids, 13; total (inclusive school trips), 250. Fate: Severely damaged by a school crew during a landing. Dismantled.

L–17.—Placed in service 20–10–15; placed out of commission 28–12–16. Commander, Ehrlich; from 10–8–16; Kraishaar. Chief Off., Dietsch; from 10–8–16, Zimmerman. Flights war, 36; raids, 8; total, 80. Fate: Burned in the aerodrome in Tondern. *L–24* on entering bumped the corner of the aerodrome and burst into flames. The fire spread onto *L–17*.

L–18.—Placed in service 3–11–15; placed out of commission 17–11–15. Commander, Dietrich 2. Chief Off., v. Nathusius. Flights war, 0; raids, 0; total, 4. Fate: Burned in Tondern, due to negligence in cleaning the gas filling apparatus.

L–15.—Type, L–10 to L–19, inclusive, 10 ships; capacity, 31,900 cu. m.; length, 163.5 m.; diameter, 18.7; useful load, 16,200; no. of gas cells, 16; no. and power of engines, 4—210 h. p., from 1915 at 240 h. p.; speed, 26.7 m. p. s.; construction completed, 1915.

L–19.—Placed in service 27–11–15; placed out of commission 2–2–16. Commander, Löwe. Chief Off., Braunhof. Flights war, 1; raids, 1; total, 14 Fate: Landed on the North Sea after an attack owing to damaged engine and artillery fire. Was seen by the English steamer *King Stephan*, but crew was not saved in spite of calls for assistance. Ship sank.

L–20.—Placed in service 21–12–15; placed out of commission 3–5–16. Commander, Stabbert. Chief Off., Schirlitz. Flights war, 28; raids, 11; total, 19. Fate: Owing to mismanagement (misjudging the weather situation) the ship drifted to Norway and was obliged to land near Stavanger because of lack of gasoline. Was demolished.

L–21.—Placed in service 10–1–16; placed out of commission 28–11–16. Commander, Dietrich; 25–6, Stelling; 15–8, Frankenberg. Chief Off., v. Nathusius. Schütz; 15–8, Salzbrunn. Flights war, 28; raids, 11; total, 74. Fate: Attacked by English aeroplanes on a return flight and shot down.

L–22. Placed in service 3–3–16; placed out of commission 14–5–17. Commander, Dietrich; 1–10–10, Holländer; 14–2–17, Lehmann. Chief Off., Eisenbeck; 1–10–10, Frey; 14–2–17, v. Knobelsdorff. Flights war, 41; raids, 8; total, 82. Fate: Shot down while searching for mines near Terschelling by English aeroplanes, which turned up unexpectedly.

L–23.—Placed in service 16–4–16; placed out of commission 22–8–17. Commander, v. Schubert; 24–8, Ganzel; 7–1, Stabbert. Chief off., Rothe; 30–1–17; Bockhold; Maass, 14–6, Dinter, Hamann. Fate: Was surprised by enemy's forces at Lynwick. Was not adequate for service any longer, as was old model.

L–24.—Placed in service 20–5–16; placed out of commission 28–12–16. Commander, Koch; 19–10, Friemel. Chief Off., v. Collani; 19–10, Berger. Flights

L 25.—Taken over from the army (*LZ–88*) as an experimental ship. Type, L–20, L–24, 5 ships; capacity, 35,800 cu. m.; length, 178.5 m.; diameter, 18.7 m.; useful load, 17,900 kg.; no. of gas cells, 18; no. and power of engines, 4—240 h. p.; speed, 26.5 m. p. s.; construction, end 1915, first part 1916.

war, 23; raids, 4; total, 44. Fate: Burned while entering aerodrome in Tondern. Fire caused by formation of sparks.

L–25.—Placed in service 19–1–17; placed out of commission 15–9–17. Commander, Freiherr v. Buttlar; 31–8, Sommerfeldt. Chief Off., v. Schiller; 31–8, Gebauer. Flights war, only experimental trips; total, 39. Fate: Taken over by the army as experimental ship. Stationed in Potsdam Wildpark. Later demolished, as was old model.

L–30.—Placed in service 30–5–16; placed out of commission 17–11–17. Commander, Freiherr v. Buttlar; 12–1–17, Friemel; 23–4; Bödecker. Chief Off., v. Schiller; Berger; Vermehren. Flights war, 37; raids, 10; total, 123. Fate: North Sea till 5.17; then Baltic Sea. After having ended service in the Baltic Sea in Seerappen, dismantled by order of the Entente summer 1920 and partly delivered to Belgium.

L–31.—Placed in service 17–7–16; placed out of commission 1–10–16. Commander, Mathy. Chief Off., Friemel; 30–10; Werner. Flights war, 7; raids, 6; total, 29. Fate: Shot down burning during an attack over London.

L–32.—Placed in service 2–9–16; placed out of commission 24–9–16. Commander, Peterson. Chief Off., Brodrück. Flights war, 4; raids, 3; total, 13. Fate: Was shot down burning over London.

L–33.—Placed in service 2–9–16; placed out of commission 24–9–16. Commandant, Böcker. Chief Off., Schirlitz. Flights war, 1; raids, 1; total, 4. Fate: Was heavily damaged by artillery fire during the raid on London. Was obliged to land in England. Was destroyed as far as was possible by the crew. Crew taken prisoner.

L–34.—Placed in service 27–9–16; placed out of commission 28–11–16. Commandant, Dietrich 2. Chief Off., v. Nathusius. Flights war, 5; raids, 2; total, 11. Fate: Shot down burning in raid on Sunderland.

L–32.—Type, L–30, L–41, 12 ships; capacity, 55,200 cu. m.; length, 198 m.; diameter, 23.9 m.; useful load, 32,500 kg.; no. of gas cells, 19; no. and power of engines, 6—240 h. p.; speed, 28.7 m. p. s.; construction completed, 1916.

L–35.—Placed in service 18–10–16; placed out of commission 10–18. Commandant, Ehrlich; 27–9 experimental ship (Sommerfeldt, Vermehren). Chief Off., Dietsch, Gebauer. Flights war, 15; raids, 2; total, 88. Fate: From 27–9, stationed as experimental ship in Jüterbog.

L–36.—Placed in service 7–11–16; placed in commission 7–2–17. Commandant, Schütze (Viktor) 10–12–16, Eichler. Chief Off., Mieth. Flights war, 4; raids, 0; total, 20. Fate: Stranded and wrecked by Rethen on the Aller owing to negligence in navigation.

L–37.—Placed in service 27–11–16; placed out of commission 14–12–17. Commandant, Prölss, 4–5–17; Gärtner. Chief Off., Brand; Jahn. Flights war, 21; raids, 4; total, 70. Fate: In the North Sea until 7–17, then in the Baltic Sea. After the end of the Baltic Sea war placed out of commission in Seddin. Dismantled by order of the Entente in the summer 1920 and parts delivered to Japan.

L–38.—Placed in service 26–11–16; placed out of commission 29–12–16. Commandant, Dietrich. Chief Off.. Eisenbeck. Flights war, 1; raids, 0; total, 12. Fate: Owing to lack of gasoline, the ship was obliged to land during an attemped raid on St. Petersburg. Was dismantled, as there was no possibility of return.

L–39.—Placed in service 18–12–16; placed out of commission 16–3–17. Commandant, Koch (Robert). Chief Off., v. Collani. Flights war, 3: raids, 1: total, 23. Fate: Shot down burning by artillery fire by Compiegne on return from a raid on England.

L–40.—Placed in service 7–1–17; placed out of commission 17–6–17. Commandant, Sommerfeldt. Chief Off., Gebauer. Flights war, 8: raids, 2; total, 29. Fate: Through faulty navigation, badly damaged; dismantled.

L–41.—Placed in service 30–1–17: placed out of commission 11–6–18. Commandant, Manger. Chief Off., Gruner. Flights war, 18; raids, 3; total, 35; (exclusive school). Fate: From 9–12–17, school ship. 11–6–18: placed out of commission.

L–42.—Placed in service 28–3–17; placed out of commission 9–11–18. Commandant Dietrich. Chief Off., Eisenbeck. Flights war, 24; raids, 4; total, 69. Fate: From 7–6–18, school ship; 9–11–18, placed out of commission; dismantled June 19.

L–43.—Placed in service 15–3–17; placed out of commission 14–6–17. Commandant, Kroushaar. Chief Off., Zimmermann. Flights war, 7; raids, 1; total, 14. Fate: Brought down burning by artillery fire by Luneville on return from raid over London.

L–44.—Placed in service 5–4–17; placed out of commission 20–10–17. Commandant, Stabbert. Chief Off., Rothe. Flights war, 12: raids, 4; total, 26. Fate: Surprised by English aeroplanes in the North Sea, attacked and brought down burning.

L–45.—Placed in service 7–4–17; placed out of commission 20–10–17. Commandant, Kölle. Chief Off.. Schüth. Flights war, 14: raids, 2; total, 26. Fate: Landed in Sisteron (France) on return from raid on England, because of lack of benzene, in bad weather. Ship destroyed by crew.

L–46.—Placed in service 1–5–17; placed out of commission 5–1–18. Commandant, Holländer. Chief Off., Frey. Flights war, 22; raids, 3; total, 36. Fate: Destroyed in the great fire in Ahlhorn. Fire was probably an act of revenge by own crew.

L–47.—Placed in service 4–5–17; placed out of commission 5–1–18. Commandant, Wolff (Richard), 3–7–17. v. Freudenreich. Chief Off., Fischer. Flights war, 21; raids, 3; total, 45. Fate: Same as *L–46.*

L–48.—Placed in service 23–5–17; placed out of commission 16–6–17. Commandant, Fichler. Chief Off., Mieth. Flights war, 2: raids, 1: total, 10. Fate: Brought down burning during an attack. Oblt. Mieth and 2 men of the crew saved.

L–49.—Placed in serviec 15–6–17; placed out of commission 20–10–17. Commandant, Gayer. Chief Off.. Dehn. Flights war, 3; raids, 1; total, 15. Fate: Landed in France on return from raid over England in cause of lack of benzene. Crew taken prisoner.

L–50.—Placed in service 18–6–17; placed out of commission 20–10–17. Commandant, Schwonder. Chief Off., Westphal. Flights war, 7: raids, 2: total, 19. Fate: Owing to lack of gasoline, the ship was obliged to land in France on the return from a raid on England, rose again with 4 men, landed in Switzerland, rose again without crew and probably fell into the Mediterranean.

L–51.—Placed in service 26–7–17; placed out of commission 5–1–18. Commandant, Dose. Chief Off., Trube. Flights war, 4; raids, 1; total, 37. Fate:

Burned by the members of the maintenance crew, probably for sabotage. The fire spread and destroyed 5 ships and 3 hangars in Ahlhorn.

L–52.—Placed in service 24–7–17; placed out of commission 9–11–18. Commandant, Friemel. Chief Off., Berger. Flights war. 21; raids, 1; total, 37. Fate: Placed out of commission 8–11–18. Dismantled June 20.

L–53.—Placed in service 21–8–18; placed out of commission 11–8–18. Commandant. Prölss. Chief Off., Brand., from 7. v. Pröck. Flights war, 23; raids, 4; total, 53. Fate: Attacked by English plane during observation trip, shot down burning.

L–54.—Placed in service 20–8–17; placed out of commission 19–7–18. Commandant, Bockhold, 19–9–17; Buttlar. Chief Off., Maass v. Schiller. Flights war, 16; raids, 2; total, 52. Fate: Destroyed in the aerodrome in Tondern by bomb dropped by English plane.

L–46.—Type, L–42, L–52. 11 ships; capacity, 55,800 cu. m.; length, 196.5 m.; diameter, 23.9 m.; useful load, 39,000 kg.; no. of gas cells, 18; no. and power of engines, 6—260 h. p.; speed, 29.9 m. p. s.; construction completed, 1917.

L–53 to L–65, inclusive.—Capacity, 56,000 cu. m.; length, as above; diameter, as above; useful load, 40,000 kg.; no. of gas cells, 14; no. and power of engines, as above: speed, 31.8 m. p. s.; construction, 1917–18.

L–55.—Placed in service 8–9–17; placed out of commission 20–10–17. Commandant, Flemming. Chief Off., Kohlhauer. Flights war, 1; raids, 1; total, 12. Fate: On return from attack on England was obliged to land near Tieffenort on the River Werra, owing to lack of gasoline; was dismantled, as there was no possibility of return.

L–56.—Placed in service 28–9–17; placed out of commission 8–11–18. Commandant, Stelling; 1–4–18, Zaeschmar. Chief Off., Upmeyer. Flights war, 18; raids, 1; total, 44. Fate: Destroyed June 20.

L–57.—Placed in service 25–9–17; placed out of commission 7–10–17. Commandant, Bockhold. Chief Off., Maass. Grussendorff. Flights war, 0; raids, 0; total, 4. Fate: Built for the trip to Africa. Made trial trip to Jütergog in unfavorable weather. As return was not possible and the ship hit the ground violently in the wind, the commander ordered it to be burned.

L–58.—Placed in service 4–11–17; placed out of commission 5–1–18. Commandant, Schütze (A). Chief Off., Liesmann. Flights war, 2; raids, 0; total 14. Fate: Destroyed in the fire at Ahlhorn.

L–59.—Placed in service 3–11–17: placed out of commission 7–4–18. Commandant, Bockhold. Chief Off., Maass. Grussendorff. Flights war, 4; raids, 1; total, 18. Fate: African ship. On return from Africa was arranged as observation ship for the Mediterranean; was burned during a flight in the Strait of Otranto, probably owing to negligence in handling gasoline.

L–60.—Placed in service 2–4–18; placed out of commission 19–7–18. Commandant, Flemming. Chief Off., v. Kruse. Flights war, 12: raids, 1; total, 23. Fate: Destroyed in the aerodrome at Tondern by English bomb.

L–61.—Placed in service 19–7–17; placed out of commission 9–11–18. Commandant, Ehrlich; 21–5–18, Bödecker. Chief Off., Dietsch. Schwabach. Flights

L–59.—Type, L–57, L–59, 2 ships; capacity, 68,500 cu. m.; length, 226.5 m.; diameter, 23.9 m.; useful load, 52,100 kg.; no. of gas cells, 16; no. and power of engines, 5—260 h. p.; speed, 28.6 m. p. s.: construction, 1917; special type for African undertaking.

war, 11; raids, 2: total, 39. Fate: Delivered to Italy August 20, wrecked during the first trip.

L–62.—Placed in service 29–1–18; placed out of commission 10–5–18. Commandant, Manger. Chief Off., Gruner. Flights war, 4: raids, 2: total, 20. Fate: Shot down while on an observation trip.

L–63.—Placed in service 10–3–18; placed out of commission 9–11–18. Commandant, v. Freudenreich; 5–10–18, Ratz. Chief Off., Horstmann. Flights war, 19; raids, 3; total, 49. Fate: Destroyed June 20.

L–64.—Placed in service 13–3–18; placed out of commission 9–11–18. Commandant, Schütze (A); 8–9–18, Frey. Chief Off., Liesmann. Flights war, 14: raids, 1; total, 20. Fate: Delivered to England June 20.

L–65.—Placed in service 3–5–18; placed out of commission 9–11–18. Commandant, Dose; 27–8, Vermehren. Chief Off., Trube. Flights war, 10; raids, P; total, 29. Fate: Destroyed June 20.

L–70.—Placed in service 8–7–18; placed out of commission 6–8–18. Commandant, v. Lossnutzer. Chief Off., Krüger. Flights war, 2; raids, 1; total, 7. Fate: Was shot down burning in the twilight. Capt. Strasser, the leader of the airships, was on board.

L–71.—Placed in service 10–12–18; placed out of commission 9–11–18. Commandant, Dietrich 1. Chief Off., Eisenbeck. Flights war, 0; raids, 0; total, 8. Fate: Delivered to England June 20.

L–72.—Still unfinished at the time of the revolution. Delivered to France.

LZ–87.—Placed at the disposal of the navy by the army.

LZ–88.—From May 22–16 to 15–9–16, placed at the disposal of the navy by the army. Commandant, Capt. Falck. Oblt. Gerstenberg. Flights war, 13

LZ–98.—From 1–5–17 to 1–7–17 placed at the disposal of the navy by the army. Commandant, Oblt. v. Gemmingen. Flights war, 15, in the Baltic Sea.

L–71.—Type, L–70, L–72, 3 ships; capacity, 62,200 cu. m.; length, 211.5 m.; diameter, 23.9 m.; useful load, 44,500; no. of gas cells, 15; no. and power of engines, L–70, 7—260 h. p., L–71 and 72, 6—260 h. p.; speed, 36.4 m. p. s.; construction, 1918.

LZ–111.—From 1–5–17 to 31–7–17 placed at the disposal of the navy by the army. Commandant, Oblt. Gerstenberg. Flights war, 7, in the Baltic Sea.

LZ–113.—From 31–7 placed at the disposal of the navy by the army. Capt. Falck. Placed in service by the navy 1–8–17; placed out of commission 18–1. Commandant, Zaeschmar. Station, Baltic Sea. Chief Off., v. Preock. Flights war, 17; raids, 3; total, 27. Fate: Was placed out of commission at Seddin after completion of the operations in the Baltic Sea. Delivered to France October 20.

LZ–120.—From 1–5 to 31–8–17 placed at the disposal of the navy by the army. (Oblt. Lehmann.) Flights war, 17 (Baltic Sea, a 105-hour flight). Placed in service by the navy 1–9–17; placed out of commission 18–1. Commandant, v. Lossnitzer. Chief Off., Krüger. Flights war, 6; raids, 3; total 12. Fate: Was placed out of commission at Seerappen after completion of the operations on the Baltic Sea. Delivered to Italy December 20.

SL–3.—Placed in service 20–2–15. Placed out of commission 1–5–16. Commandant, Bömack. Wolff (G). Koch. v. Wachter. Chief Off., Wolff (G), Kretschmann. v. Colloni. Dehn. Flights war. 33: raids. 1; total. 70. Fate: Fell into the Baltic Sea owing to rudder defect. Was so badly damaged that repairs were impossible.

SL–4.—Placed in service 25–4–15. Placed out of commission 11–12–15. Commandant. Wolff (R). Chief Off.. Fischer. Flights war, 23; raids, 9; total, 32. Fate: Was so badly damaged by door of aerodrome being violently opened by storm that repairs were impossible.

SL–6.—Placed in service 19–9–15. Placed out of commission 19–11–15. Commandant, Bömack. Chief Off., Schaper. Flights war, 6; raids, 0; total, 11. Fate: Shortly after rising the ship exploded. broke into two parts which

SL–4.—Type, SL–3, 4; capacity, 32,400 cu. m.: useful load, 13,400 kg.; no. of gas cells, 15; no. and power of engines, 4—210 h. p.: speed. 24 m. p. s.; construction, 1914–15.

fell to the ground at some distance from one another. Crew dead. Cause of the accident not known.

SL–8.—Placed in service 20–4–16. Placed out of commission, 18–12–17. Commandant. Wolff (G) 24–12–17. v. Wachter. 2–10–17. Ratz. Chief Off.. Kretschmann, v. Lossow. Flights war. 45; raids, 3; total, 92. Fate: Dismantled after completion of the operations in the Baltic.

SL–9.—Placed in service 31–5–16. Placed out of commission 23–3–17. Commandant, Wolff (R). 3–1–17. Kölle. 2–3. Jöhncke. Chief Off., Fischer, Schütz, Martin. Flights war. 17; raids. 2: total, 47. Fate: Disappeared in a storm during the flight from Seerappen to Seddin.

SL–12.—Placed in service 9–11–16. Placed out of commission, 29–12–16. Commandant. Kölle. Chief Off., Dinter. Flights war. 2; raids, 0; total, 11. Fate: Emergency landing in bad weather, owing to failures of engine. Was so badly damaged that salvaging was impossible and was dismantled.

SL–14.—Placed in service 24–8–16. Placed out of commission, 17–5–17. Commandant, v. Wachter. Chief Off., Goldmann. Flights war, 4; raids, 1; total, 21. Fate: After several breakages in the frame and other failures to the ship's body (constructive and technical damages), the ship was dismantled after having sustained injuries making it useless for war purposes.

SL–20.—Placed in service 10–9–17; placed out of commission 5–1–18. Commandant, Wolff (G); 2–12–16, Ratz. Chief Off., Kretschmann. Flights war, 3; raids, 0; total, 16. Fate: Was in the Baltic Sea until 15–12–20, then stationed in the North Sea and was finally destroyed in Ahlhorn during the great fire.

SL–22.—Was not accepted at the front. Between June and October, 1918, the ship made a total of 9 trial trips and was placed out of commission in October, 1918. Was dismantled in Jüterbog 1920. Parts were delivered to the entente.

SL–12.—Type, SL–12, 14; capacity, 38,780 cu. m.; useful load, 20,000 kg.; no. of gas cells, 17; no. and power of engines, 4—240 h. p.; speed, 26 m. p. s.: construction, 1916–17.

SL–7.—Was placed at the disposal of the navy from the 30–7–16 to the 25–9–16.

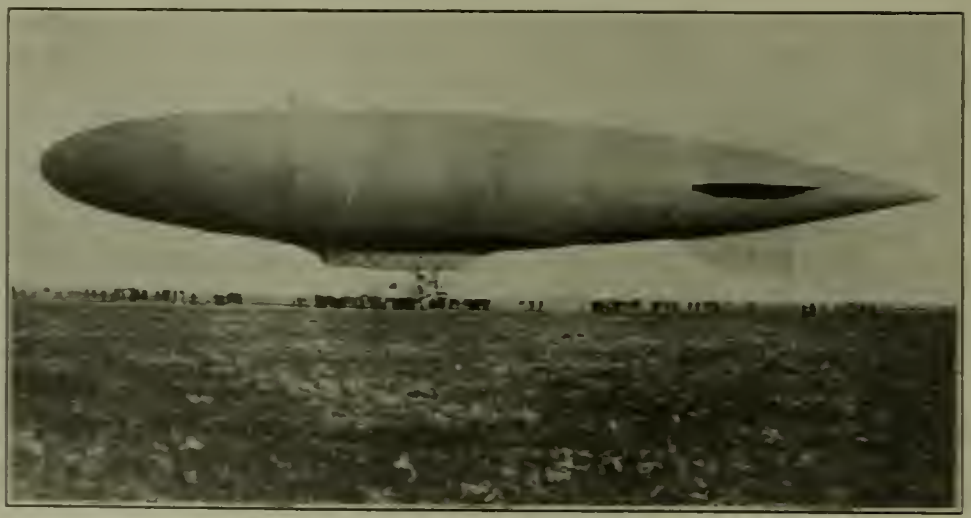
PL–6.—Placed in service 1–9–14; placed out of commission 27–12–14. Commandant, Oblt. z. S. Hirsch; from 15–9, Oblt. Meyer. Flights war, 4; raids, 0; total 34. Fate: Was taken to pieces because was too small for demands of war. Was only used over Baltic Sea from Kiel.

PL–19.—Placed in service 18–9–14; placed out of commission 25–1–15. Commandant, Capt. Stelling, from 1–1–15, Oblt. Meyer. Flights war, 9; raids, 1; total, 20. Fate: Was shot at during raid on Libau. The ship landed on the sea and was destroyed, the crew taken prisoners.

PL–25.—Placed in service 23–5–15; placed out of commission 30–3–16. Commandant, Capt, Stelling; from 9–8, Capt. Manger. Chief Off., Westphal. Gruner. Flights war, 39; raids, 0; total, 88. Fate: Was used in the North Sea until Nov. 15, then on the Baltic Sea. On the 30–3–16 was turned over to the army for experimental purposes.

PL–VI.—Capacity, 8,000 cu. m.: useful load, 3,000 kg.: construction, 1910: engines, 2—110 h. p., N. A. G. engines: speed, 15 m.: p. s.

PL–XIX.—Capacity, 10,300 cu. m.; useful load, 3,300 kg.; construction, 1914: engines, 2—180 h. p., Maybach; speed, 21.4 m. p. s.



PL–25.—Capacity, 13,400 cu. m.: useful load, 6,000 kg.: construction, 1914; engines, 2—210 h. p.; speed, 19.5 m. p. s.; ballonets, 2.

PL–26.—Burned in the aerodrome during inflation before having been placed in service.

PL–27.—Was not accepted by the navy as was not considered fit for war duty.

M–4.—Placed in service 28–12–14: placed out of commission 3–11–15. Commandant, v. Jena. Chief Off., Schiltz. Flights war, 24. Further particulars are missing. Fate: Was only used in the Baltic Sea and then dismantled, as repairs would have been to expensive (new hull out of rubber material).

Naval air stations.

Name.	Accommodations available.	Gassing equipment.
Nordholz	One double revolving hangar, 200 meters long	Gas system from 1916.
	Two small stationary sheds, 180 meters	High pressure.
	One stationary double shed, 240 meters	Do.
	Two double sheds, 270 meters	Do.
Fuhlsbuttel	One double shed: October, 1916, out of service	Gas flasks.
Kiel	One small shed: November, 1915, out of service	Do.
Leipzig	One double shed, 180 meters; April, 1915, out of service.	Do.
Dresden	One double shed, 160 meters; September, 1916, out of service.	Do.
Tondern	Two sheds, 180 meters; winter 1917–18, torn down	Gas flasks 1915 to 1916; gassing equipment with high pressure.
	One double shed, 240 meters.	
Hage	Four sheds, 180 meters; April, 1917, out of service	Gassing arrangement.
Seddin	One shed, 180 meters; 1 double shed, 240 meters; November, 1917, station out of service.	Gassing arrangement with high pressure.
Wainoden	Shed, 200 meters; November, 1917, station out of service.	High-pressure truck system.
Seerappen	One double shed, 240 meters; November, 1917, placed out of service; no more ships available.	High-pressure truck system; gassing arrangement.
Ahlhorn	Four double sheds, 240 meters; January, 1918, 3 sheds destroyed by explosion; 2 double sheds, 270 meters.	Gas equipment; high pressure.
Wildeshausen	Summer 1917, turned over by the army; 1 shed, 200 meters.	Gas flasks and truck system.
Wittmundhaven	Summer 1917, turned over by army; 1 double shed, 210 meters; 1 double shed, 240 meters.	High-pressure truck system.
Namur	One field shed, 180 meters; out of service, 1916	Gas flasks.
Duren	....do	Do.
Jambol in Bulgarien	One shed, 240 meters; turned over by the army November, 1917, for the African undertaking; April, 1918, out of service.	High-pressure truck system.
Potsdam Wildpark	One double shed, 180 meters; August, 1917, placed out of service.	High-pressure truck system and gasometer.
Juterbog	Two double sheds, 240 meters; for the experimental ship L 35.	High-pressure truck system.

Flight statistics of naval aircraft.

ZEPPELINS.

Type name.	No.	Flights.		Months in service.	Per ship.			Per month flights.	
		War.	Total.		War.	Total.	Months in service.	War.	Total.
23000 L 3 (L 8)	6	211	509	51.5	35.0	85.0	8.6	4.0	10
24900 L 9	1	85	140	18.0	85.0	140.0	18.0	5.0	8
31900 L 10–19	10	328	818	102.5	33.0	82.0	10.3	3.0	8
35800 L 20–24	5	180	322	52.0	36.0	64.0	10.0	4.0	6
55200 L 30–41	12	150	406	68.0	14.0	34.0	5.5	2.0	6
55800 L 42–52	11	158	308	77.5	14.0	28.0	7.0	2.0	4
56000 L 53–65 (L 57 and 59 excluded)	11	147	335	78.0	12.0	33.0	7.0	2.0	5
68500 L 57 and 59	2	7	22	6.5	.....	.....	.....	.....	.....
62200 L 70 and 71	2	2	15	2.0	.....	.....	.....	.....	.....
Turned over by army to navy, LZ 87, 88, 98, 101, 113, 120	6	89	99	26.0	.....	.....	.....	.....	.....
Total	66	1,357	2,947	481.0	21.0	45.0	7.5	3.0	6

Flight statistics of naval aircraft—Continued.

SCHÜTTE LANZ.

Type name.	No.	Flights.		Months in service.	Per ship.			Per month flights.	
		War.	Total.		War.	Total.	Months in service.	War.	Total.
32400 SL 3, 4	2	56	102	21.5	28.0	51.0	7.5	3.0	6
35000 SL 6	1	6	11	2.0					
38700 SL 8, 9, 12, and 14	4	70	171	41.5	17.0	43.0	10.0	2.0	4
56000 SL 20, 22	2	3	25	8.0					
Army SL 7	1	3	3	1.0					
Total	10	138	312	74.0	14.0	31.0	7.0	2.0	4
PARSEVAL.									
PL 6, 19, 25	3	53	142	21.0	18.0	47.0	7.0	3.0	7
GROS-BASENACH.									
M IV	1	24		10.0					
GRAND TOTAL.									
All airships	80	1,572	3,476	586.0	19.7	43.5	7.0	2.7	6

NEW ZEALAND.

NAVAL DEFENSE.

November, 1923.

By the Australasian defense act, 1887, provision was made for the payment by New Zealand of a proportional part of the cost of the establishment and maintenance of a British naval force to be employed for the protection of trade in Australasian waters. Under this act a sum of approximately £20,000 per annum was paid by New Zealand to the Imperial Government.

In 1903, consequent on the passing of the Australian and New Zealand naval defense act, the annual contribution payable by New Zealand was raised to "a sum not exceeding £40,000."

By the naval subsidy act, 1908, the contribution of the Dominion was again increased, this time to a sum of £100,000, payable annually for 10 years from May 12, 1909.

In 1909 New Zealand presented the battle cruiser *New Zealand* to the Imperial Government. This ship is now to be scrapped as a result of the Washington conference.

The naval defense act, 1913, provides for the establishment of a New Zealand naval force by voluntary enlistment for a prescribed period of not less than two years, members on discharge to be drafted

into the New Zealand Royal Naval Reserve for such period as may be prescribed, for service only in time of war; the ships and personnel forming the force to pass under the control and to be at the disposition of the Imperial Government in time of war.

A commencement was made with the formation of a New Zealand division immediately prior to the war, when H. M. S. *Philomel* was commissioned with ranks and ratings lent from the royal navy to serve as a training ship for the formation of a small naval force. The *Philomel* was employed under the orders of the British Admiralty throughout the war, and no opportunity was afforded for the commencement of a scheme of training.

In 1919 Admiral of the Fleet Viscount Jellicoe of Scapa, G. C. B., O. M., G. C. V. O., visited New Zealand in H. M. S. *New Zealand*, and presented his report making recommendations and suggestions for the naval defense of the Dominion.

In 1920 H. M. S. *Chatham* was presented to New Zealand by the Imperial Government, and was commissioned on October 1 of that year with officers and men of the Royal Navy, the officers on loan therefrom, the men partly on loan, but mainly transferred to the New Zealand division of the Royal Navy. The *Chatham* flies the broad pennant of Commodore Alan G. Hotham, C. M. G., R. N., appointed in command of that ship, as commodore commanding the New Zealand station and as naval adviser to the New Zealand Government. On the arrival of the *Chatham* in New Zealand waters the *Philomel*, which had been paid off toward the end of the war, was again put into commission as a training ship, for which purpose she had in the meantime been converted. The *Philomel* also carries out the duties of depot ship at Auckland. The period of first engagement was, by order in council, fixed at 12 years, with subsequent reengagement for periods of 5 years, on a system of deferred pay in lieu of pension; and the period of enrollment in the reserve on discharge from the seagoing forces was fixed at 10 years, or up to the age of 40, for service only in time of war. A commencement was made in May, 1921, with the recruiting of New Zealand boys and youths for training as seamen and stokers, of whom about 150 have been entered to date, in addition to a small number of specialist ratings.

Legislation was passed in February, 1922, authorizing the formation of a New Zealand Royal Naval Reserve by voluntary enlistment therein, in addition to the drafting thereto of ratings discharged from the seagoing forces. An order in council of July 10, 1922, prescribes the conditions of service in the various classes of the reserve. All reservists, other than those of the inactive reserve as referred to above, are required to perform specified periods

of training in ships of the New Zealand division. The reserve, when formed, will provide a nucleus for local defense.

A naval board was constituted by order in council of March 14, 1921, charged with the control of all matters relating to the naval forces, upon the policy directed by the minister, and vested with the executive command of the naval forces, the board to be composed of the minister of defense (president) and the following members: The commodore commanding New Zealand station (first naval member), the chief staff officer to the commodore (temporarily, as second naval member), the secretary to the commodore commanding (secretary to the board).

By order in council of June 20, 1921, it was provided that the ships and personnel comprising the New Zealand naval forces shall be described respectively as forming and belonging to "The New Zealand division of the Royal Navy," which shall be the official designation of the force.

H. M. S. *Veronica* which had been on the New Zealand station since 1920, was recommissioned in March, 1922, for further service on the station. H. M. S. *Laburnum* arrived in New Zealand waters from England during the same month. These two sloops are provided and maintained by the home government, their duties consisting mainly of policing the South Pacific Islands within the limits of the New Zealand station.

UNITED STATES.

THE UNITED STATES AS A SEA POWER.

Among the great nations the geographic position of the United States is unique in several respects. We are isolated from the other powers of the world by two great oceans, which, while being barriers for defense, are obstacles to our carrying on offensive warfare in a probable enemy's territory. It is true that we have extensive land frontiers, but these frontiers face two countries of comparatively little military strength. But these land frontiers offer gateways to the invasion of the United States by a nation that is able to transport land forces across the seas. These frontiers are, therefore, an element of weakness, especially that fronting on Canada.

The possession of land frontiers is an element of weakness, but the compactness of the United States is a distinct element of strength. Especially is this so as long as we are not ready to meet instantly a major attack against us. Our resources, both industrial and military, being within our boundaries, are concentrated, due to this compactness, and can be mobilized more easily for a great effort before any part of the whole may come under enemy control.

This compactness of resources alone is an advantage in our favor in trade in that raw materials do not have to be moved to great distances to be manufactured; and the cost of manufactured articles should, therefore, be less than in foreign countries. This offsets to a great degree the nearness of other nations to world markets, where raw materials are necessarily transported long distances before they can be manufactured. Therefore, the United States is admirably situated in regard to foreign markets, not only in South and Central America but to a great extent in Africa, and certainly in Eastern Asia. Being the source of raw materials nearest Europe, the United States should be able to compete more advantageously than Australia, South America, and Asia in supplying the needs of manufacturing countries in Europe.

Our position on two oceans is to a certain extent a weakness strategically in that these two fronts are widely separated. If we are attacked on both these fronts at once, we must assume a defensive attitude on one while taking the offensive on the other. With the Panama Canal in our possession, we occupy a central position with regard to enemies who attempt to attack us simultaneously in the Pacific and in the Atlantic. But nevertheless we must utilize the great power of support which continental United States can put behind our efforts, whether defensive or offensive. And in order to make this support felt in greatest measure, we must have bases on both our Atlantic and Pacific coasts. For this reason, if for no other, our coast lines are our most vital areas. They form the barriers for our defense, and hence must be denied an enemy who attempts to occupy any portion of them to use as gateways of invasion. They give to our military forces all the offensive vitality that these forces must have to wage war—places for the overseas assemblage of these forces and depots from which must flow all the sustenance that overseas offensive operations require to be successful. If we desire to maintain our war-making ability as represented by man power and resources, no matter in what part of the country these may be located, it is essential that our energies, both in peace and war, be directed first to the retention of our frontiers.

With our most probable enemy in the Pacific, our fleet remains concentrated on our Pacific coast, and in order to operate effectively must there find its means of support. If overseas offensive action is to be undertaken, the Pacific coast is the mainspring of such action for both the Army and Navy. There is, however, another aspect to the question, if we consider that our territory is exposed to attack from the Philippines to our Atlantic seaboard. The central position for our naval forces in peace time is then dictated to be the United States Pacific coast. Nevertheless, in order to be able to use this central position effectively, there must be a gateway from the

Pacific to the Atlantic through which our fleet can pass with facility and rapidity to be in readiness to meet an attack from across the Atlantic before such an attack has time to develop. Our power of action in the Atlantic and in the Pacific depends, therefore, on our tenure of the Panama Canal, the connecting avenue between the two oceans. It is narrow, a great distance from home sources of support, and touching territory not under our control. Therefore, without a shadow of doubt, it must be strong enough in itself to withstand any attack that may be directed against it, if it is to be an asset to us in time of war. The problem of its defense must be considered more from the viewpoint that it is a link in the line of communications rather than that it is a base from which to operate defensively or offensively. However, while it may have features of weakness, its great distance from possible enemy bases gives it great strength. The importance of our coast lines, especially the Pacific coast and the Gulf coast, becomes again apparent when it is considered that they are both nearer the Canal than any enemy bases from which it can be attacked. We have, therefore, access to the Canal by at least one ocean and can send reinforcements and supplies to it more speedily than the enemy can gather forces in its vicinity for its seizure. The Pacific coast is therefore doubly vital in furnishing support to our strategic dispositions.

The trade route through the Panama Canal is the only important one that we control, not only from our continental possessions but from bases. We do not possess a single base that dominates any other important trade route. If we desire to cut important trade routes, we must not only move our fleet to the desired area but we must transport with it land forces sufficient to secure a base or bases; and we must then transport over long sea routes the resources necessary to support our military operations in that area.

This factor is a great element of weakness in our position, removed as it is from our possible enemies. While this distance multiplies the difficulty of offensive operations by an enemy in continental United States, it also works the other way. It makes our difficulties greater in offensive operations in Asia and in Europe. We have no bases worthy of the name in either area, but, assuming that an attack comes from across the Atlantic, positions that may be used against us are Newfoundland, Canada, Nova Scotia, Bermuda, Jamaica, and Trinidad. As you will find in working on war plans, our greatest problems come from distance, lack of bases of our own in areas in which our interests lie, and potential enemy bases lying near our frontiers.

Our sea frontiers are extensive and contain many good harbors easily accessible from inland. The flow of commerce from internal sources of production to our ports meets with little difficulty as long

as our transportation facilities are maintained. This is true in spite of our extent of territory which to-day is an asset in that our population has reached such numbers as to be adequate for development of our resources and for defense. Our inlets, bays, and harbors are a source of weakness if they are not fortified and properly defended. The problems of local defense are being worked out jointly by the Army and Navy.

Whether or not the people of the United States are capable of taking advantage of the favorable circumstances of their position is open to a wide diversity of opinion, according to the degree of optimism or pessimism with which the problem is approached. I believe that the character of the population is such that when the opportunities for gain abroad are understood, the American people will respond by building up a merchant marine, by taking to the sea, and by living in increasing numbers in foreign ports as the necessity of trade may dictate. We have a population which by nature is pioneering and it does not lack an element that can be trained with facility for the callings of the sea and air. Now that the population is increasing beyond that point where they can all be used in internal development, the necessity has arisen, and will be more apparent as years go on, for a greater proportion of them to gain a livelihood from foreign trade. I believe that the ever increasing competition to make a living within the United States resulting from increase in population will create emigration from the United States of those who wish to seek greater opportunities than the limits of domestic industry can provide.

If we continue to be a creditor nation, our capital investments abroad will grow in increasing volume. If these investments are wisely distributed among our producing population, increasing interest will be manifest in the affairs of foreign countries. There will then be an element in our voting population whose tendency will be to see that their foreign investments are protected. Jealously guarding the lives and property of our citizens abroad, as the British have theirs for so many years, will also have a tendency to overcome the spirit of timidity that exists to-day toward ventures in foreign lands and that is a distinct detriment to trade expansion.

The United States is endowed by nature with an abundance of natural resources. There is no other area in the world of equal richness in this respect. Nor have the people been backward in developing these resources. But we have reached the point where production greatly exceeds domestic consumption. We must begin to study means to dispose of surplus products at a profit. I believe that this is the great problem of to-day. Hand in hand with its solution must be solved the questions of the price of commodities, employment, transportation both by land and sea, communications,

trade facilities in foreign ports, and the maintenance of adequate naval forces to prevent unfair measures by our competitors. When these questions are solved we need not worry about the standards of living of our citizens, education, or the propagation of the race.

It is evident to-day that the character of our Government is being affected seriously by injection into it of representatives of this bloc and that bloc, all standing on platforms of radicalism in different degrees. Therefore the attention of lawmakers is directed too much to domestic questions—the price of wheat, freight rates, the migration of the negro northward, and what not. Senator Magnus Johnson states correctly that what the world needs is more trade. But he is against a merchant marine. If he and others in the Government directed their attention to the ways and means of using our money, our railroads, and our ships to move surplus supplies to places in the world where they are needed, a great many of the domestic problems confronting us would disappear. Our Government, not being continuous, seems to fall short in gaining sustained popular support for a continuous policy of foreign-trade expansion. This lack of direction is caused by efforts to combat false theories and by shortsighted policy that looks to temporary solutions that are mere expediencies in the solution of our domestic problems. Our Government may be a powerful machine for waging war, but in peace time the constant fencing for local advantages and the direction of attention to local affairs prevents leadership for the support of broad national policies. As a consequence, that small minority which looks outward is the only agency for the education of the people and the fostering in them of a national spirit that insures support and perseverence in the prosecution of a continuous policy.

Our foreign trade at the present time is a result of natural growth that has been neither fostered nor well directed. Yet it is coming into competition with that of other nations to such an extent as to arouse serious antagonism and to have caused them to create obstructions of one kind or another against it and in favor of their own trade. Our principal rivals are Great Britain in all world markets and Japan in the markets of the Far East. Incidents in other countries aimed against commercial interests of United States citizens are frequent. Our policy is that of the open door—equal opportunities with other countries for trade in every quarter of the globe. This is the keystone of our future commercial expansion. It needs potential force to obtain recognition and respect from our competitors. This force of necessity must be mobile and, therefore, primarily must be naval in character. As for its adequacy, it must be strong enough to make even the greatest naval power think twice before striking at our trade in any quarter. Secondly, the people of the United States should be educated in the meaning of the open-door policy,

and in its vital bearing on the welfare of every class, including the farmer, the laborer, and the manufacturer; third, the agency directing this campaign of education should be the Government without regard to party—this policy should be a national policy continuous and sustained; and fourth, the Government, having obtained the people's support of this policy, should not hesitate in protecting the property and rights of American citizens wherever these may engage in trade.

Another officer has spoken to you on the problems that confront our Navy to-day to bring it up to the point of strength and efficiency recognized by our statesmen as being that which they consider adequate, so I will not discuss this question. But there is one point I do wish to bring out again, and that is, that if we wish to make what force we have effective, we must have ports to support it in areas where our interests must be protected.

The picture of the United States is not complete without the network of transportation that is necessary to carry trade. From farm and factory are the feeders consisting of wagons, motor trucks, and railroad spurs to the great railroad systems terminating in our seaports. Ships continue the stream of traffic overseas. Take away any part of this network and our surplus commodities will remain where they are produced. We were engaged consistently before the World War in destroying our merchant marine until the bulk of our foreign trade was carried in foreign bottoms. We had no steamship lines to the east coast of South America. We had to depend on the good will of foreign shipping companies to ship freight to these regions. To reach Rio Janerio, a person had first to go to England. United States shipping engaged on trans-Pacific routes was negligible. After the war broke in Europe, foreign shipping was gradually withdrawn from our trade routes except to suit the interests of the Allies in the war. When we entered the war shipping for our troops and for the supply of our Army overseas was totally inadequate. From our necessities of the war, grew our present merchant marine. In spite of the great number of idle ships, we have to-day United States vessels on the trans-Atlantic and trans-Pacific routes, and have established lines to South America. But our merchant marine is stifled by legislative regulation that makes successful competition almost impossible. Please remember that our vessels are attempting to make a success of operations with no support and all the handicaps the law can surround them with against foreign ships subsidized by foreign governments wherever they deem it necessary to retain a monopoly of freight-carrying. Government interference with United States shipping is being duplicated in respect to the railroads. In other words, instead of studying means to increase transportation facilities, which are the

life of trade, we are doing everything possible to obstruct the flow of freight from the producer to the world consumer.

We have no great commercial bases outside of the United States such as Great Britain possesses in Bombay, Melbourne, Hongkong, Singapore, and Cape Town. Our ships, therefore, instead of getting preferential or equal treatment in the matter of fuel, supplies, repairs, and docking, must await the good will of foreigners in charge. Delays in these matters, even though short, add greatly to the cost of operation. While direct duties may not be levied against our merchandise, there are many ways that our trade may be obstructed. Berthing space at wharves, lighterage, and labor may be withheld on the plea that it is not immediately available; and goods may lie in warehouses on the ground that the capacity of the railroad is not sufficient to move it. Foreign merchants will, therefore, trade with those from whom they can obtain their supplies with the greatest facilitiy and the least cost. It is, therefore, not good policy for the United States to look with complaisancy upon the establishment by its competitors in countries commercially neutral of influence of whatever character—commercial, financial, military, or naval.

NAVAL BASES.

Reverting to the subject of naval bases, which is of the utmost importance, it is desirable to point out that naval force must have the utmost mobility of action. This does not, in the narrow sense, mean that naval forces must be able to move, but that they must be able to proceed to areas of interest and there operate without the necessity of depending on resources far distant from that area and on lines of communication that necessarily must have strong naval forces to guard them. The combat units of the Navy, to their utmost numbers, must be used primarily to operate to control the enemy lines of communication and no units should be directed to tasks that take them from this immediate mission. The creation in time of peace of naval bases in possible theaters of action is therefore indispensable to a nation having world-wide interests.

The conditions that make a naval base strategically valuable are its situation, its military strength, and its resources.

Its position must be in the theater of operations. It should not be so far advanced that lines of communication leading to it are flanked by strong enemy positions. It should, if possible, afford to the force occupying it, the advantage of the use of interior lines. Positions in narrow seas or where sea routes converge are, generally speaking, more important than those in a great ocean because it is less possible to avoid them by circuit. The value of positions depends upon nearness to a vital sea route either of our own or the enemy's. In this connection, the amount of trade that passes over

this route enters into the question as well as the nearness of the base to this route. If the position is on the crossroads of two routes, its value is greatly enhanced. Of the three conditions, situation is the most indispensable. It can not be changed. Strength and resources may be artificially supplied or increased.

The second condition, military strength, has several elements, advantageous or disadvantageous, which affect the strength of a base, but they will be found to fall under the two heads of defensive and offensive strength. The element of defense must be considered in relation to attack from the sea by ships and attack from the land. The problem is therefore a question for joint consideration by the Army and the Navy. The many problems entering into the construction of defensive works must be reconciled by military engineers. Generally speaking, a base situated on an island is stronger than a base lying in an area which has a land frontier. No port should be selected as a base which requires the greater part of a nation's force to garrison it—Port Arthur, Manila Bay, Halifax less so. The British gave up Tangiers on this account. British bases are generally islands Gibraltar, Malta, Singapore, Hongkong, Bermuda.

As the reason for the creation and existence of a base is primarily to support offensive action, its defenses from attack both by sea and land, should be so strong that it can hold out until reinforcements, both naval and land, may arrive; it should be so strong inherently that it permits of the release of naval forces for their primary rôle, offensive action.

The offensive strength of a base consists in its ability to assemble and contain a large military force both of ships of war and transports, to allow such force, safely and easily, to debouch therefrom into the open sea, and to follow such force with continued support during its operations.

It must, therefore, possess a large area of anchoring ground, with a deep and safe channel for ingress and egress, and suitable ground for the establishment of docks, warehouses, and shops for the repair and maintenance of ships. It must be favored by hydrographic conditions or by the protection of the port so as to allow a force safely and easily to proceed to sea and take up its order of battle in the presence of the enemy unmolested. Beyond that the offensive strength of the port can not be expected to reach. The ability of the port to offer continued support to a maritime force depends upon the scene and character of the operations. It should be near enough to offer equipment and refreshment, restoration and repair to such a force without jeopardizing the facility for concentration of the combat units. It should be able to maintain a stream of supplies outward and to afford swift restoration to vessels sent back from the scene of operations. This factor seemingly falls under the head-

ing of resources, but it is in fact a means of assuring sustained offensive operations.

The resources are natural and artificial, those developed in the peaceful occupation of the country and those created solely for the maintenance of war. Other things being equal, the most favorable condition is that where great natural resources have been developed. This is generally the case of the home bases of maritime nations. The port that has good strategic situation and great military strength but to which all the resources must be brought from a distance is much inferior to a similar port having a rich and developed friendly region behind it.

Dry docks are one of the most important resources required of a port because they facilitate various kinds of repairs, because without them the offensive energy of the fleet can not be maintained, and because they take the longest time to construct. They should be near the theater of operations, and they should be numerous enough to eliminate delays in the restoration of the fighting strength of ships, whether deterioration is battle damage or a result of service.

Finally, positions are of value only as their advantages are utilized to strengthen the power of military action. The United States possesses admirable positions west of Hawaii but has voluntarily relinquished its freedom of preparing them for their proper rôle in warfare.

TREATY NAVIES.

TABLE OF COMPARATIVE STRENGTH.

Data regarding ships affected by treaty, as of October 1, 1923.

	United States.		British Empire.		Japan.		France.		Italy	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Completed capital ships allowed to be retained:										
Battleships, first line	[1] 18	513,250	18	457,750	6	191,320	6	141,000	5	109,900
Battleships, second line	0	.....	0	.....	0	.....	3	56,670	2	25,200
Battle cruisers, first line	0	.....	4	122,700	4	110,000	0	.....	0	.....
Total	[1] 18	513,250	22	580,450	10	301,320	9	197,670	7	135,100
Capital ships building allowed to be completed:										
Battleships, first line	1	[2] 32,600	2	[3] 70,000	0	.....	0	.....	0	.....
Capital ships when above ships are completed:										
Capital ships armed with 12-inch guns	4	95,600	0	.....	0	.....	6	127,170	7	135,100
Capital ships armed with 13.4-inch or heavier guns	14	430,200	20	558,950	10	301,320	3	70,500	0	.....
Total	18	525,850	20	558,950	10	301,320	9	197,670	7	135,100

[1] Includes Colorado; one of North Dakota class eliminated; other retained until completion of West Virginia.
[2] West Virginia is building; when completed will replace last remaining ship of North Dakota class.
[3] Nelson and Rodney laid down December, 1922; when completed will replace Ajax, Centurion, King George V, and Thunderer.

Data regarding ships affected by treaty, as of October 1, 1923—Continued.

	United States.		British Empire.		Japan.		France.		Italy.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Aircraft carriers:										
Completed (all experimental and can be replaced)—										
Aircraft carriers, first line...	0	.....	1	19,100	0	.....	0	.....	0	.....
Aircraft carriers, second line.	1	12,700	1	14,450	1	9,500	....	.....	....	.....
Total.....	1	12,700	2	33,550	1	9,500	0	.....	0	.....
Tonnage allowed under treaty...	....	135,000	....	135,000	....	81,000	....	60,000	....	60,000
Building—										
Aircraft carriers, first line..	2	(4)	....	.....	2	[5] 53,900	0	.....	0	.....
Aircraft carriers, second line.	0	.....	2	[6] 33,740	1	[7] 9,500	1	24,830	0	.....
Ships required to be scrapped:										
Completed—										
Battleships, first line.....	0	.....	7	158,000	1	20,800	0	.....	0	.....
Battleship, second line.....	17	249,580	9	164,950	8	129,001	0	.....	0	.....
Battle cruisers, first line....	0	.....	2	52,700	0	.....	0	.....	0	.....
Battle cruisers, second line..	0	.....	4	72,100	0	.....	0	.....	0	.....
Cruisers, second line.....	0	.....	0	.....	3	42,950	0	.....	0	.....
Total.....	17	[8] 249,580	22	[9] 447,750	12	[10] 192,751	....	.....	....	.....
Building—										
Battleships, first line.....	7	291,800	0	.....	2	[11] 79,958	0	.....	0	.....
Battle cruisers, first line.....	6	261,000	....	(11)	2	[12] 82,000	0	.....	0	.....
Total.....	13	552,800	....	.....	4	161,958	....	.....	....	.....

[4] Lexington and Saratoga, which were building as battle cruisers, to be completed as aircraft carriers.
[5] Akagi, formerly building as battle cruiser, and Kaga, formerly building as battleship, to be completed as aircraft carriers.
[6] Hermes, 10,950 tons, and Eagle (ex-battleship Almirante Cochrane), which will be completed late in 1923.
[7] Shokaku projected.
[8] Includes Oregon and Illinois, which are permitted to be retained for noncombatant purposes after complying with part 2, III (B), of treaty.
[9] Includes Collingwood and Colossus, which are permitted to be retained for noncombatant purposes after complying with part 2, III (B), of treaty.
[10] Includes Asahi and Shikishima, which are permitted to be retained for noncombatant purposes after complying with part 2, III (B), of treaty.
[11] Four ships projected, not laid down.
[12] Six ships projected, keels of two being laid "as a matter of form," during conference.

Data regarding modern combatant ships whose numbers are not affected by the treaty, as of October 1, 1923.

Type.	United States.		British Empire.		Japan.		France.		Italy.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Completed:										
Monitors, first line (14-inch plus, 6,000 tons plus)	0	.....	3	22,670	0	.....	0	.....	0	.....
Cruisers, first line (18,600 tons, 4 15-inch, 31 knots) [1]	0	.....	2	[1] 37,200	0	.....	0	.....	0	.....
Cruisers, first line (8,000 to 10,000 tons, 27 knots plus) [2]	0	.....	2	[2] 19,500	0	.....	0	.....	0	.....
Light cruisers, first line (3,000 tons plus, 27 knots plus)	4	30,000	33	[3] 136,690	13	65,450	3	14,680	5	21,000
Flotilla leaders (1,500 tons plus)	0	.....	16	27,810	0	.....	1	2,485	5	8,700
Destroyers, first line (800 to 1,500 tons)	274	[4] 325,412	180	205,540	63	65,928	20	19,122	27	30,913
Light mine layers	14	16,674	0	.....	0	.....	0	.....	0	.....
Submarines, first line (500 to 1,000 tons)	78	53,573	22	[5] 19,860	31	27,368	24	[6] 18,403	10	8,040
Fleet submarines (1,000 tons plus, 20 knots plus)	3	3,318	6	[7] 11,540	2	2,400	0	.....	0	.....
Monitor submarines (1,600 tons, 12-inch gun)	0	.....	3	4,800	0	.....	0	.....	0	.....
Mine layers submarines	0	.....	4	3,560	0	.....	0	.....	0	.....
Building or projected:										
Cruisers, first line (8,000 tons plus, 27 knots plus)	0	.....	2	19,500	4	40,000	3	24,000	2	[8] 20,000
Light cruisers, first line (3,000 tons plus, 27 knots plus)	6	45,000	2	15,100	8	52,280	0	.....	0	.....
Mine layers, first line	0	.....	1	[9] 7,500	1	([10])	0	.....	0	.....
Flotilla leaders (1,500 tons plus)	0	.....	2	3,500	0	.....	6	14,400	3	6,600
Destroyers, first line (800 to 1,500 tons)	....	([11])	3	3,750	31	40,900	12	16,536	4	4,600
Submarines, first line (500 to 1,000 tons)	15	13,122	5	4,590	18	15,520	12	7,020	4	([8])
Fleet submarines (1,000 tons plus)	3	[13] 6,375	1	2,780	23	[12] 29,365	9	9,792	0	.....

[1] Courageous and Glorious, Glorious to be reconstructed as an aircraft carrier.
[2] Classed by British Admiralty as light cruisers.
[3] Does not include Aurora, Cordelia, and Penelope on disposal list, and Caroline, Royal Naval Volunteer Reserve drill ship. Total tonnage of these is 14,500.
[4] Does not include 7 stranded destroyers of 8,505 tons.
[5] Does not include G–4 on disposal list, and E–48, target vessel.
[6] Three of above are mine-laying submarines.
[7] Does not include K–8, K–9, K–15, and K–16; total tonnage 7,520 on disposal list.
[8] Authorized but not laid down. 1923 program.
[9] Estimated.
[10] Projected.
[11] Twelve boats authorized, but authority to construct suspended.
[12] Estimated total displacement. Minimum estimate based on displacement given by Admiral Kato in announcing post treaty building program.
[13] Six additional boats authorized, but construction held in abeyance.

Data regarding obsolescent or obsolete vessels still retained and patrol vessels.

Type.	United States.		British Empire.		Japan.		France.		Italy.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Monitors, second line	0	.....	2	11,600	0	.....	0	.....	11	8,144
Cruisers, second line (7,700 tons plus, 27 knots minus)	11	139,450	1	7,700	6	54,642	10	121,155	4	39,150
Light cruisers, second line (3,000 tons plus, 22 to 27 knots)	3	11,250	[1] 14	[1] 72,690	[2] 5	[2] 23,942	2	8,760	3	10,300
Light cruisers, second line (3,000 tons plus, less 22 knots)	9	31,925	0	.....	[3] 1	[3] 3,420	2	9,412	3	9,492
Mine layers (27 knots minus)	4	16,096	1	5,070	4	[4] 29,111	0	.....	5	2,040
Destroyers, second line (500 to 800 tons)	21	15,582	6	4,200	12	7,850	23	16,397	14	10,240
Submarines, second line (300 to 500 tons)	27	10,645	24	[5] 10,520	10	3,244	24	9,610	33	9,610
Fleet submarines, second line (1,000 tons plus, 20 knots minus)	0	.....	0	([6])	0	.....	2	3,094	0	.....
Patrol gunboats (500 to 3,000 tons)	4	5,012	68	[7] 67,712	9	14,022	55	44,331	6	7,229
River gunboats	4	993	18	8,665	3	556	5	834	1	220
Yachts	9	9,502	4	12,565	1	([7])	2	1,725	6	4,515
Patrol vessels (100 to 500 tons)	54	[8] 27,000	59	[9] 14,328	36	13,029	43	8,433	98	21,112
Patrol vessels under 100 tons	39	[10] 3,003	55	[11] 761	3	34	47	3,324	308	6,822

[1] Includes Boadicea and Glasgow believed to have main armament removed. Eliminating these two, 12 ships of 64,590 tons.
[2] Chitose, 4,992 tons, completed 1899. Tone, 4,100; Chikuma, 4,950; Hirado, 4,950; Yahagi, 4,950; completed since 1910.
[3] Tsushima, completed in 1904.
[4] Does not include Tsugaru, 6,630 tons, on disposal list.
[5] Does not include CH-14 and CH-15 on disposal list.
[6] Does not include six of "J" class, 1,200 tons each, on disposal list.
[7] Sloops and large trawlers.
[8] Eagle boats.
[9] Drifters and small trawlers.
[10] Submarine chasers.
[11] CMB and ML boats.

As of October 1, 1923.

Type.	United States.		British Empire.		Japan.		France.		Italy.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Building:										
Patrol gunboats	1	1,575	0	.....	0	.....	0	.....	0	.....
River gunboats	0	.....	0	.....	4	1,352	0	.....	0	.....
Auxiliaries:										
Completed—										
Colliers	7	112,120	1	[1] 9,700	0	.....	1	2,341	0	.....
Destroyer tenders	7	80,700	6	44,980	0	.....	0	.....	0	.....
Ammunition ships	2	21,200	0	.....	0	.....	0	.....	0	.....
Refrigerator and store ships	5	63,300	0	.....	0	.....	6	3,000	0	.....
Hospital ships	4	35,917	1	7,500	0	.....	3	17,180	0	.....
Cargo ships	9	80,670	6	8,072	5	45,305	0	.....	3	9,210
Mine sweepers	45	42,750	68	51,674	45	[2] 8,469	30	11,065	50	14,690
Oil tankers	20	283,026	66	500,504	12	165,899	8	57,779	12	69,728
Transports	3	36,800	0	.....	0	.....	3	7,857	0	.....
Repair ships	2	25,170	1	9,600	1	11,000	2	17,026	0	.....
Submarine tenders	7	44,443	10	49,106	4	24,146	0	.....	0	.....
Tugs (seagoing, over 500 tons)	38	32,855	43	31,039	22	(?)	10	8,185	7	4,419
Heavier-than-air aircraft tenders	0	.....	2	10,150	1	5,875	0	.....	0	.....
Lighter-than-air aircraft tenders	1	11,000	0	.....	0	.....	0	.....	0	.....
Surveying ships	1	4,000	11	11,290	4	7,524	9	5,226	1	2,050
Auxiliaries, miscellaneous	5	44,425	6	9,729	6	3,256	0	.....	2	1,030
Building or projected—										
Destroyer tenders	2	21,200	0	.....	0	.....	0	.....	0	.....
Oil tankers	0	.....	0	.....	3	46,200	0	.....	0	.....
Transports	1	10,000	0	.....	0	.....	0	.....	0	.....
Repair ships	1	10,000	0	.....	1	[3] 10,000	0	.....	0	.....
Submarine tenders	1	10,000	0	.....	1	3,500	0	.....	0	.....

[1] Other colliers are time chartered. [2] Displacement of 21 on 14. [3] Estimated.

Data regarding ships in commission, reserve and out of commission, November 28, 1923, ships to be scrapped by treaty not included.

Type.	United States.[1]			British Empire.[1]					Japan.			
	Total number of type.	In commission.	Out of commission.	Total number of type.	In commission.	Reduced commission and ¼ complement.	In reserve.	Out of commission.	Total number of type.	In commission.	Reserve ready.	Out of commission.
Battleships, first line (12-inch plus, 20,000 tons plus 20 knots plus)	[2] 19	[2] 19	.....	10	[3] 14	3	....	1	6	5	1	....
Battleships, second line (20,000 tons minus)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Battle cruisers, first line (13.8-inch plus, 16,000 tons, 27 knots plus)	.....	.....	.....	[4] 4	2	....	....	2	4	3	1	....
Aircraft carriers, first line (27 knots plus)	.....	.....	.....	1	.....	....	....	1	.....	.....	.....	....
Aircraft carriers, second line (3,000 tons, 27 knots minus)	1	1	.....	1	1	....	....	....	1	1	....	....
Monitors, first line (14-inch plus, 6,000 tons plus)	.....	.....	.....	3	.....	....	....	3	.....	.....	.....	....
Monitors, second line (6,000 tons minus)	.....	.....	.....	2	.....	....	....	2	.....	.....	.....	....
Cruisers, first line (18,000 tons, 31 knots)	.....	.....	.....	[5] 2	.....	....	[5] 2	....	.....	.....	.....	....
Cruisers, first line (8,000 tons plus, 27 knots plus)	.....	.....	.....	2	1	....	....	1	.....	.....	.....	....
Cruisers, second line (7,700 tons plus, 27 knots minus)	11	6	5	1	.....	....	....	1	6	4	2	....
Light cruisers, first line (3,000 tons plus, 27 knots plus)	4	4	.....	33	28	1	2	2	13	13	....	....
Light cruisers, second line (3,000 tons plus, 27 knots minus)	12	5	7	14	4	4	3	3	6	4	2	....
Mine layers, second line (27 knots minus)	4	2	2	1	1	....	....	....	5	....	4	1
Flotilla leaders (1,500 tons plus)	.....	.....	.....	16	8	1	7	....	.....	.....	.....	....
Destroyers, first line (800 tons to 1,500 tons)	[6] 274	[6] 103	171	180	60	36	84	....	63	51	12	....
Destroyers, second line (500 to 800 tons)	21	.....	21	6	.....	....	6	....	12	8	4	....
Light mine layers (3,000 tons minus, 27 knots plus)	14	6	8	.....	.....	.....	.....	.....	.....	.....	.....	.....
Submarines, first line (500 to 1,000 tons)	78	78	.....	22	13	....	9	....	31	31	....	....
Submarines, second line (300 to 500 tons)	27	4	23	24	19	....	4	1	10	10	....	....
Fleet submarines, first line (1,000 tons plus, 20 knots plus)	3	.....	3	6	5	....	1	....	2	2	....	....
Fleet submarines, second line (1,000 tons plus 20 knots minus)	.....	.....	.....	[7] 6	.....	.....	.....	[7] 6	.....	.....	.....	....
Monitor submarines (1,500 tons plus, 12 knots plus)	.....	.....	.....	3	3	....	....	....	.....	.....	.....	....
Mine layer submarines	.....	.....	.....	4	1	....	3	....	.....	.....	.....	....
Patrol gunboats (500 to 3,000 tons)	4	4	.....	[8] 68	39	5	2	22	9	6	3	....
River gunboats	4	4	.....	18	13	....	4	1	3	3	....	....
Yachts	9	5	4	4	2	....	....	2	1	....	....	1
Patrol vessels (100 to 500 tons)	54	29	25	[9] 59	[9] 10	7	1	41	36	5	31	....
Patrol vessels (100 tons minus)	39	32	7	55	.....	....	....	55	3	....	....	3
Colliers	7	5	2	1	1	....	....	....	.....	.....	.....	....
Destroyer tenders	7	6	1	6	3	....	3	....	.....	.....	.....	....
Ammunition ships	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	....
Refrigerator ships	5	3	2	.....	.....	.....	.....	.....	.....	.....	.....	....
Hospital ships	4	2	2	1	1	....	....	....	.....	.....	.....	....
Cargo ships	9	6	3	6	6	.....	.....	.....	5	4	1	....
Mine sweepers	45	30	15	68	15	1	1	51	[10] 45	....	....	[10] 45
Oilers	20	11	9	66	56	....	....	10	12	9	3	....
Transports	3	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	....
Repair ships	2	2	.....	1	1	.....	.....	.....	1	1	.....	....
Submarine tenders	7	7	.....	10	7	2	....	1	2	2	....	....
Tugs	38	29	9	43	41	1	....	1	[10] 22	....	....	([10])
Heavier than aircraft tenders	.....	.....	.....	2	1	....	....	1	1	1	....	....
Lighter than aircraft tenders	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	....
Surveying ships	1	1	.....	11	9	....	....	2	4	1	3	....
Auxiliaries, miscellaneous	5	5	.....	6	4	....	1	1	6	....	....	6

[1] Includes auxiliaries manned by crews on yard craft or mercantile agreement.
[2] Delaware and North Dakota have been placed out of commission since Oct. 1. When West Virginia is completed 18 battleships will be in commission.
[3] Includes midshipmen's training ship.
[4] Two paid off for refit.
[5] Courageous and Glorious. Glorious designated for reconstruction as aircraft carrier.
[6] Seven stranded destroyers not included.
[7] Are on disposal list.
[8] Sloops "P" and "PC" boats and large trawlers.
[9] Thirty-one drifters shown as out of commission manned by crews of parent ships.
[10] Manned by men from naval district. No regular crew assigned.

TABLE I.—*Showing comparative personnel strengths of navies of United States, Great Britain, and Japan on October 1, 1923, with explanatory tables and notes.*

	United States.			British Empire.			Japan.		
	Officers.	Men.	Total.	Officers.	Men.	Total.	Officers.	Men.	Total.
(1) Regular Navy	7,821	[1,3,3] 84,983	92,804	[4] 7,727	[5] 81,016	88,743	[6] 7,550	58,274	65,824
(2) Royal Australian Navy [7]				412	3,627	4,039			
(3) Royal Canadian Navy [8]				77	318	395			
(4) New Zealand Division of Royal Navy [7]				36	739	775			
(5) Civilian crews of auxiliaries [10]					3,790	[10] 3,790			
(6) Royal Air Force assigned to naval aviation [2]				319	1,907	2,226			
Total	7,821	84,983	92,804	[11] 8,571	[11] 91,397	99,968	7,550	58,274	65,824

[1] Total number men appropriated for is 86,000. It is estimated that the Navy will be recruited to full strength by Jan. 1, 1924.

[2] The Royal Air Force supplies the personnel for naval aviation. The only strictly naval personnel in the naval aviation service consists of 22 officers and 17 men; 515 officers and 3,309 men are employed in United States naval aviation exclusive of those for general service on aircraft carriers and tenders. The figures shown for the Royal Air Force are those attached to the coastal area. The total strength of the Royal Air Force is 3,152 officers, 26,488 men. Of this total about 1,500 officers and 16,000 men are performing duty at the Air Ministry, at training stations, supply depots, manufacturing plants, etc., which duty is both for that portion of the air force detailed to coastal area and for that portion serving in cooperation with the Army and as a separate air force. A portion of these should be added in a comparison.

[3] An analysis of the turnover in enlisted personnel for the United States shows that 37,859 men will be enlisted during the fiscal year 1924, of which 25,390 will be first enlistments and 12,469 will be reenlistments. The number of recruits entered in the Royal Navy for year ending Sept. 30, 1923, was 4,778.

[4] Includes 297 on half pay, unemployed pay, lent to Royal Air Force or foreign Governments. Includes 544 midshipmen at sea who correspond to our ensigns. Includes 122 naval constructors and 77 civil engineers. Naval constructors and civil engineers are not officers in British Navy, but perform same duties as naval constructors and civil engineers who are officers in United States Navy. Does not include 131 officers lent to Dominion Navies, who are included in items 2, 3, and 4.

[5] Does not include 665 lent to foreign and Dominion Governments who are included in items 2, 3, and 4.

[6] Includes 372 midshipmen at sea. Does not include 232 civilians of relative rank to and including commander's rank performing naval duties.

[7] Includes 84 officers and 3 men lent to the Royal Navy, 88 officers and 396 men lent from the Royal Navy.

[8] Includes 33 officers and 4 men lent to the Royal Navy, 8 officers and 10 men lent from the Royal Navy.

[9] Includes 33 officers and 289 men lent from Royal Navy.

[10] The total shown, 3,790, includes the merchant marine officers manning auxiliaries, but data is not available to separate this total into officers and men. These men man auxiliaries which are manned in United States Navy by regulars.

[11] Does not include the Royal Indian marine, consisting of 210 officers and 2,013 men. During the past year the coast guard has been broken up, 352 remaining under the Admiralty for naval radio stations, 935 under the board of trade for life-saving service, and 450 under the customs for preventive service. Those remaining under the Admiralty are included above.

[12] The following gives the percentage of officers and men afloat on Oct. 1, 1923:

United States:
- Officers (per cent) 65.2
- Men (per cent) 67

Great Britain:
- Officers (per cent) *54
- Men (per cent) 68.2

Japan:
- Officers (per cent) 58.25
- Men (per cent) 63.48

*Estimated.

NOTE.—This includes officers and men ashore at aviation stations which are not included in British Navy.

TABLE II.—*Showing number civilians on mercantile or yard craft agreement provided for in Navy Estimates 1923–24 to man auxiliaries.*

	United States.	British Empire (total).	Japan (total).
(1) Tankers [1]	All manned by regulars, United States Navy.	1,645	Tankers assigned by Navy.
(2) Various yard craft [2]		1,488	
(3) Naval armament vessels [3]		200	Other items (2) to (6) of this table manned by Navy.
(4) Victualing yard craft [4]		259	
(5) Hospital ships [5]		106	
(6) Fleet service tugs [6]		92	
Total		3,790	

[1] See p. 253, Navy Estimates, 1923-24.
[2] Includes 1,309 for yard craft, 353 for fleet fueling craft at dockyards, 96 for store carriers. See p. 106, 112, and 119, Navy Estimates.
[3] Includes 43 for seagoing vessels (store ships), 91 for lighters and shore directing staff, 66 for tugs and harbor launches. See p. 127, Navy Estimates.
[4] See p. 44, Navy Estimates.
[5] See p. 53, Navy Estimates.
[6] See p. 58, Navy Estimates.

NOTE.—There are no colliers in British Navy. Colliers are time chartered; all sea transportation for fuel, stores, etc., for naval use is done in merchant vessels or in auxiliaries with merchant marine crews

Reserves.

	Officers.	Men.	Total.
UNITED STATES.			
United States, class 1	363	7,114	7,477
United States, class 2	1,064	3,193	4,257
United States, class 3	86	5	91
United States, class 4	0	0	0
United States, class 5	65	38	103
United States, class 6	2,678	7,829	10,507
Total	4,256	18,179	22,435
BRITISH EMPIRE.			
Royal Naval Reserve	1,395	7,915	9,310
Royal Fleet Reserve [1]	.....	[1] 27,111	27,111
Royal Naval Volunteer Reserve	227	2,430	2,657
Special Reserve of Engineer Officers	177	.....	177
Officers on emergency list	227	.....	227
Royal Naval Auxiliary Sick Berth Reserve	.....	1,275	1,275
Royal Australian Naval Reserve	120	4,016	4,136
Royal Canadian Naval Volunteer Reserve	.....	[2] 500	500
South African Royal Naval Volunteer Reserve [3]	33	[3] 611	644
Total	2,179	[4] 43,858	46,037
JAPAN.			
Japanese Naval Reserve	1,819	29,600	31,419

[1] Does not include 4,128 marine ratings in this reserve.
[2] Approximate numbers.
[3] Twelve officers and 126 men are on active duty. Of these, 1 officer and 24 men are lent from regular personnel of Royal Navy.
[4] Does not include 7,664 retired officers of all ages, and 18,768 pensioners, all under 55 years of age who are additional.

Marine Corps.

United States.[1] [2]			British Empire.[1] [2]			Japan.[3]		
Officers.	Men.	Total.	Officers.	Men.	Total.	Officers.	Men.	Total.
1,145	19,352	20,497	454	9,366	9,820	0	0	0

Percentage of total number officers and men afloat: *United States*, 9.96; *Great Britain*, 55.8.
[1] United States marines, 61 officers and 1,982 men, a total of 2,043, serve afloat; Royal marines, 140 Officers and 5,339 men, a total of 5,479, serve afloat.
[2] In United States, marines are employed in guarding navy yards. In Great Britain none of the regular Marine Corps are so employed, but this duty is performed by 7 officers and 255 men of the Royal Marine Police, composed of marine pensioners, 697 Metropolitan police, and 398 civilian police, who are borne on navy votes. In Japan 850 marine police under the Minister of Marine are employed for this duty.
[3] Eight hundred and fifty Marine Police under Minister of Marine, who perform same duties as United States Marines guarding navy yards.

Remarks on Enlistments.

UNITED STATES.

Enlistments in the navy are for 4 years only. There are still some short-term enlistments unexpired and this tends to increase the turnover.

It is estimated that 37,859 men will be enlisted during the fiscal year 1924, of which, 25,390 will be first enlistments and 12,469 will be reenlistments. An examination of the enlisted personnel as of June 30, 1923, shows the following:

Men with less than 4 years' service	63,620
Men with 4 and less than 8 years' service	10,288
Men with 8 and less than 12 years' service	4,901
Men with 12 and less than 16 years' service	2,438
Men with more than 16 years' service	1,108
	82,355

GREAT BRITAIN.

On October 1, 1923, the 81,016 men in the Royal Navy were divided as follows:

(*a*) Number boys under training and boys (service)	4,953
(*b*) Serving 1st enlistment of continuous service (viz, for 12 years)	51,725
(*c*) Serving 2d period of continuous service (viz, 10 years to complete 22 years for pension)	18,740
(*d*) Number serving in special service enlistment (viz, for 5 years with 7 years in Fleet Reserve	2,695
(*e*) Noncontinuous service	1,993
(*f*) Foreigners	327
(*g*) Pensioners and miscellaneous	583
	81,016

JAPAN.

Enlistments for all petty officers is for 10 years (6 years' active, 4 years' reserve).

Other enlisted men is for 12 years. For volunteers, 6 years' active service, 6 years' first reserve. For conscripts, 4 years' active, 3 years' first reserve, 5 years' second reserve.

Comparative table showing division of commissioned and subordinate officers in each corps according to rank on October 1, 1923.

(Officers of dominion navies are not included in this table. One hundred and thirty-one officers lent from royal navy to dominion navies are included.)

	Admiral of fleet.			Admiral.			Vice admiral.			Rear admiral.			Captain.			Commander.		
	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.
Line [1]	6	.....	.....	12	4	12	22	3	15	64	42	61	288	197	191	650	352	438
Medical	.....	.....	.....	.....	.....	.....	1	.....	1	6	4	5	17	33	18	214	62	49
Dental	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Supply	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	5	18	24	22	153	47	39
Chaplain	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	.....	.....	4	.....
Instructor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	4	.....	20	5	.....
Construction	(2)	.....	.....	(2)	.....	.....	(2)	.....	1	(2)	2	4	(2)	20	17	(2)	31	8
Civil engineer	(3)	.....	.....	(3)	.....	.....	(3)	.....	.....	(3)	2	.....	(3)	6	.....	(3)	15	.....
Total	6	.....	.....	12	4	12	23	3	17	72	53	75	326	297	248	1,038	516	534

	Lieutenant commander.			Lieutenant.			Lieutenant, junior grade.			Ensign.			Midshipmen at sea.			Total.		
	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.
Line [1]	798	638	741	1,612	1,471	1,062	376	862	493	.....	986	836	[4] 518	.....	335	4,346	4,555	4,184
Medical	104	160	78	57	464	129	.....	57	104	.....	.....	68	.....	.....	.....	399	780	452
Dental	20	28	.....	22	120	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	43	154	.....
Supply	128	74	76	185	365	126	21	72	63	.....	.....	67	[5] 26	.....	37	533	585	435
Chaplain	.....	.....	.....	.....	61	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	99	84	.....
Instructor	13	.....	.....	48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84	9	.....
Construction	(2)	6	8	10	134	17	(2)	31	10	(2)	.....	.....	.....	.....	.....	132	224	65
Civil engineer	(3)	6	.....	(3)	70	.....	(3)	.....	.....	(3)	.....	.....	.....	.....	.....	77	99	.....
Total	1,063	912	903	1,934	2,685	1,334	397	1,034	670	.....	986	971	544	.....	372	5,713	6,490	[6] 5,136

[1] In line officers, British Navy, are included officers or executive and engineer branches and 11 specialist lieutenants, i. e., signal lieutenants, ordnance lieutenants, electrical lieutenants, etc. In line officers, Japanese Navy, are included officers of executive and engineer branches and 170 officers in ordnance construction, engineering construction and hydrographic branches.

[2] Naval constructors are not officers in British Navy, but perform same duties as naval constructors, United States Navy, and are paid from navy votes. See last column for total number which include 10 shipwright lieutenants who are classed herein as constructors. See total column.

[3] Civil engineers are not officers in British Navy, but perform same duties as civil engineers, United States Navy. See total column for number.

[4] British Navy has no rank corresponding to ensign. The total shown is number of midshipmen at sea who are classed in navy estimates as subordinate officers and who perform same duties as ensigns, United States Navy.

[5] Paymaster midshipmen at sea perform same duties as ensigns supply corps, United States Navy. Classed by Navy estimates as subordinate officers.

[6] Includes 372 midshipmen at sea. Does not include 816 special officers of rank of lieutenant, sublieutenant 1st class and sublieutenant 2nd class, who are listed in table below as commissioned warrant officers. Does not include 232 civilians of commissioned officer rank performing naval duties.

The number of midshipmen under training on October 1, 1923, was as follows: United States 2,498, Great Britain, 588; Japan, 597; training as executive and engineer officers and 106 students training as medical officers, engineer constructors and ordnance constructors.

Table showing division of commissioned warrant and warrant officers in each corps according to rank.

	Commissioned warrant.			Warrant.			Total.		
	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.	Great Britain.	United States.	Japan.
Line	[1] 492	430	702	[2] 1,239	367	1,376	1,731	797	2,078
Medical	4	110	14	14	8	41	18	118	55
Band			9			11			20
Supply	24	70	58	72	226	118	96	296	176
Instructor	29			141			170		
Construction	[3] 41	78	33	[4] 89	42	52	130	120	85
Total	590	668	[5] 816	1,555	643	1,598	2,145	1,331	2,414

[1] Includes 24 mates who rank with sublieutenants, also 9 commissioned ordnance officers and 9 commissioned electrical officers.
[2] Includes 25 miscellaneous coast guard wireless stations, etc.
[3] Commissioned shipwrights.
[4] Warrant shipwrights.
[5] These officers are of the rank of lieutenants, sublieutenants first class, and sublieutenant second class, and correspond to ex-temporary officers who were given permanent commissions in the United States Navy.

Table showing approximate distribution in ranks and corps of the officer perosnnel of the Dominion navies.

[December 4, 1923.]

	Captains.			Commanders.			Lieutenant commanders.			Lieutenants.		
	Australia.	Canada.	New Zealand.	Australia.	Canada.	New Zealand.	Australia.	Canada.	New Zealand.	Australia.	Canada.	New Zealand.
Line	3			3	2		16	7		89	38	
Medical				1			4			9	1	
Dental							1			3		
Supply				2	1		8			16	1	1
Chaplain												
Instructor				1			3			2		
Construction												
Civil engineer												
Total	3	0	0	7	3	0	32	7	0	119	40	1

	Lieutenant junior grade.			Ensign.			Midshipmen at sea.			Total.			Grand total.
	Australia.	Canada.	New Zealand.	Australia.	Canada.	New Zealand.	Australia.	Canada.	New Zealand.	Australia.	Canada.	New Zealand.	
Line	25	5					25	7		161	59	0	220
Medical										14	1		15
Dental										4			4
Supply	2									28	2	1	31
Chaplain										10			10
Instructor										6			6
Construction													
Civil engineer													
Total	27	5	0	0	0	0	25	7	0	223	62	1	286

Commissioned warrant and warrant officers.

	Commissioned warrant and mates.	Warrant.	Total.
Australia	29	61	90
Canada	0	5	5
New Zealand	0	2	2
Total	29	68	97

Eleven commissioned and warrant officers unaccounted for.

NOTE.—This table shows approximate distribution of Dominion Officer Personnel according to rank and corps. It does not include Royal Naval officers lent to Dominion governments. It does include Dominion officer personnel lent to the Royal Navy.

○

German airship flights

on Mai 31st 1916

= German fleet

== English fleet

ORKNEY IN.

Miss W. 19°15'W.

Miss W. 12°30'W.

Miss W. 16°30'W.

Miss W. 12°15'W.

£9 £16

£14. £21. £23

ORKNEY IS.
Scapa Flow
Thurso
Cormarty F.
Peterhead
Dundee
EDINBURGH
Blyth
NEWCASTLE
Shields
Scarborough
Flamborough
HULL
Grimsby
The Wash
Norwich
Yarmouth
Lowestoft
Orfordness
Harwich
LONDON
Sheerness
Chatham
Margate
Ramsgate
Dover
Folkestone
PORTSMOUTH
Portland
BRISTOL
Calais
Grisnez
Boulogne
Dünkirchen
Ostende
Zeebrugge
ANTWERPEN
Flissingen
van Holland
ROTTERDAM
AMSTERDAM
Texel
Helder
Vlieland
TERSCHELLING
ROTTUMERIEG
BORKUM
NORDERNEY
Emden
HELGOLAND
Husum
Tonning
Busum
CUXHAVEN
Bremerhaven
Hanstholm
Thyborön
Hirtshals
Skagen
Utsire
Stavanger
Egersund
Arendal
Christiansand
Lindesnäs
Missw. 19°15'W.
Missw. 15°30'W.
Missw. 12°30'W.
Missw. 12°15'W.
L24
L22
L11
L13
L17
German fleet
English fleet

Airship flights
on June 1st 1916.

heavy arrow designates:
„sighting of enemy by airships"

Airship flights
on August 19th 1916

heavy arrow meanes:
„sighting of english war ships by Zeppelins."

= German fleet

ORKNEY IN
Kirkwall
Scapa Flow
Thurso
Lerwick
Peterhead
Dundee
EDINBURGH
Berwick
NEWCASTLE
Tyne
Sunderland
Tees
Scarborough
Flamborough Hd
HULL
Humber
Grimsby
The Wash
Norwich
Yarmouth
Lowestoft
Orfordness
Harwich
LONDON
Sheerness
Chatham
Margate
Ramsgate
Dover
Folkestone
Dungeness
PORTSMOUTH
Newhaven
Beachy Hd
Portland
BRISTOL
Ytterö
Stavanger
Arendal
Christiansand
Lindesnes
Skagen
Hanstholm
Thyborön
Esbjerg
Skagerrak Huk
SYLT
AMRUM
Husum
Büsum
HELGOLAND
NORDERNEY
BORKUM
WILHELMSHAVEN
CUXHAVEN
Brunsbüttel
Emden
TERSCHELLING
TEXEL
Helder
Ymuiden
AMSTERDAM
Hoek van Holland
ROTTERDAM
Vlissingen
Zeebrügge
ANTWERPEN
Ostende
Dünkirchen
Calais
Gr. Grimez
Boulogne

L 24
L 22
L 21
L 32
L 30
L 13
L 11
L 31

Missw. 19°15'W.
Missw. 15°30'W.
Missw. 12°15'W.
Missw. 12°30'W.

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

NUMBER 2—1924.

FEBRUARY, 1924.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines.

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OFFICE OF NAVAL INTELLIGENCE.

MONTHLY INFORMATION BULLETIN.

NUMBER 2—1924—FEBRUARY, 1924.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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NAGATO.

Running full-power trials

GREAT BRITAIN.

DESIGN OF RIVER GUNBOATS.

December, 1923.

An opportunity was had to discuss the design of gunboats for service on the Yangtse River at the Admiralty and the following information was obtained which may be considered reliable:

The gunboats of the *Insect* class (Cockchafer), fitted with light yarrow oil fired boilers and light reciprocating engines, have proved in general useful and successful on the river, with certain exceptions.

The *Bee*, *Cicala*, *Cockchafer*, *Gnat*, and *Mantis* are carried in the December, 1923, navy list on the China station. It is stated that the oil fired boats are preferred to those using coal. Since the boats have been built the draft has been abnormally increased with the result that the speed of 14 knots is only obtained with difficulty. At certain seasons 14 knots is a minimum to run the gorges and any new boat should have 15 knots to give a slight margin of speed.

It should be borne in mind that many alterations and additions will be found necessary to promote habitability. No personnel should be quartered below the main deck.

The *Insect* class is considered too long (237.5 feet) to make the quick turns required in river navigation and any new boat would be kept below 200 feet. This matter of length and quick turning (multiple rudders) has been found most important.

The older gunboats (*Moorhen*, etc.) of 13 knots (too slow) were shipped out in sections. The *Insect* class boats went out to China under their own steam and had considerable trouble, due to insufficient longitudinal strength. At least one boat wes seriously injured in the Mediterranean in a short sea, breaking near the stern.

It would be recommended to the United States Navy to ereet any new gunboats at Shanghai or to build them there with yarrow machinery or equivalent.

GREAT BRITAIN.

ROYAL AIR FORCE TRAINING SCHOOL, CRANWELL.

December, 1923.

This school is located on the plains 11 miles from Grantham, the nearest large railway station, and is about 110 miles from London. It was originally established as a training school for the

Royal Naval Air Service. The land area consists of approximately 6 square miles, in the center of which is located the station itself. The buildings are all of war-time construction, quarters and shops being of the hut type, and hangers of the semipermanent wood and brick type. There is a group of buildings constructed for lighter-than-air purposes, and this group is of the steel type, but is not used at the present time and is marked for demolition.

The station is under the command of a commodore, and is not included in any other group command, all business being conducted directly with the Air Ministry in somewhat the same way that the Naval Academy deals with the Navy Department. Its organization is quite similar to that of the Naval Academy in that the commanding officer occupies a position similar to that of the superintendent, and there is a commandant directly responsible for the training, a position corresponding to that of commandant of midshipmen. Two districts schools are operated, one for cadets and one for boys.

The personnel is as follows:

Officers (approximately)	90
Enlisted men	600
Cadets	97
Boys	1,350
Civilian instructors	6

Cadets.—This school is operated at about half capacity. Cadets enter twice a year. They are required to take the same examinations as applicants for Woolwich and Sandhurst, and must be at the time of the examination between 17 and 19 years of age. As the system now operates, it appears that the air force gets its cadets from the lower part of the list of those who successfully pass the examination, the cadets in the higher part going into Woolwich and Sandhurst. This is rather a tender subject with the Air Ministry, and efforts are being made to have the system changed. It was stated that they obtain a fair number of cadets of high mental caliber because of the fact that some of these cadets deliberately pass the examination with low marks in order to get into the air force. The cadet course requires two years and is divided into four periods. This course is both theoretical and practical, shopwork and flying being carried on along with the studies throughout the entire course of four periods. The subjects covered under the training are similar to those covered during the first part of the course at the Naval Academy and during the course at Pensacola. The flying training consists of teaching the cadets to fly and giving them a limited amount of experience in service types. It includes no training in practical bombing, gunnery, photography, spotting, reconnaissance, or combat. The average cadet gets approximately 100 hours flying during the two years.

NAGATO.

Showing details of multipod mast.

Boys.—A training school for boys is also operated. The boys enter between the ages of 13 and 16, and the course lasts three years. When they enter, they sign up for a total of 12 years. In this school they are given military training, and are classified and trained in either the carpenter or rigging branches. They are further classified in these two classes—for instance, riggers are divided into structural and engine. The boys' training seems to be excellent, and it is said that the finished product is a very good mechanic. This school is operating to its full capacity.

The station layout is not particularly good. This is explained by the fact that it was not designed for the purpose for which it is now being used. The general condition of the buildings is fair. Cleanliness is good. The equipment is fairly good, but is badly distributed. The distinct impression is gained that the entire affair is rather amateurish and reminds one of an emergency training school during war time rather than of a peace time service academy. Its academic facilities and methods can not be compared with the Naval Academy; its training facilities and methods are certainly a long way below those of Pensacola.

Cranwell is a very disappointing station, and it is felt certain that the air force will never assume the position to which it is entitled by the organization of the services until its system of selecting and training cadets is vastly improved. It should be stated here that the fault is not entirely with the air force. Efforts have been made to obtain money to construct a proper school, but these efforts have been without success. The uncertainty of a future due to the existing laws about promotion and the unattractiveness of the surroundings, not only at Cranwell but also at the various air stations when these surroundings are compared with those of army schools and posts, are certainly sufficient to make a prospective cadet hesitate to apply for Cranwell.

JAPAN.

BUILDING PROGRAM OF AUXILIARY VESSELS.

December, 1923.

The following extract from the Japanese press represents a prophecy of the building program to be instituted when replacement begins. At this time of unsettled conditions it is probably too early to put much credence in a press statement of a replacement program but it possibly indicates the trend of thought on the matter:

The extension, as agreed upon at the last ministerial conference, of the auxiliary vessels construction program by one year so as to complete it in

1928 instead of as first scheduled, 1927, has, according to the authorities, necessitated alteration of the policy of substitute vessel construction.

The feature of the revsion lies in the lessening of the age limit for various types of warships. The Government decision is to reduce the age limit for battle cruisers from the present 24 years to 17 years, and that for destroyers and submarines from the present 16 years to 12 years, as first suggested by America at the Washington Conference.

This new policy will be put into operation after 1928 when the present program of auxiliary vessels now building is completed. The Imperial Japanese Fleet, when the above revised substitute vessel construction program is to be launched, will be as follows, according to the naval authorities:

Type.	Name.	Number of vessels.
Cruisers	Chikuma, Hirado, etc	28
Destroyers	Urakaze, Keyaki, etc	100
Submarines		75
Tenders and special ships		
Total		203 –

Or, when considered from the standpoint of formation, the above naval force will stand as follows, when the present auxiliary vessel construction program comes to an end:

Type.	Number of flotillas.	Number of vessels.
Cruisers	4	16
Destroyers	6	[1] 96 [2] 6
Submarines	6	[3] 72 [2] 6

[1] Destroyers.
[2] Flagships.
[3] Submarines.

For the maintenance of the above naval force, the navy department will, after 1928, launch the aforementioned revised construction policy, when the number of vessels to be built will be considerably reduced as shown below, and therefore the expenditure of the construction will, according to the authorities' estimation, be retrenched by something like 50,000,000 yen. Particulars about the revised program of auxiliary vessel construction will be made public in 1926. The table showing comparison of the number of vessels that the Government will have to build according to the old or revised construction program follows:

Types.	Old program.	Revised program.
Cruisers	3 5	1.75
Destroyers	· 12	8
Submarines	9	6
Total	24.5	15.75

Owing to the recent earthquake, the present program of auxiliary vessel construction has, in addition to extension of the period of its completion, suffered in various ways. Commenting on the present status of the progress of this program, the Hochi quotes the authorities concerned as follows:

"The vessels already named and ordered constructed in accordance with the auxiliary vessel construction program formulated after the Washington Conference are the two large type cruisers *Kinugasa* (7,100 tons), *Furutaka* (7,100 tons), and the *Kako* (5,550 tons); another vessel, the *Aotaka* (7,100 tons), which is to be built within the current year and two cruisers, the *Nachi* and *Myoko*, each of 10,000 tons. The construction of the 7,100-ton cruisers has already been started, while the building of the 10,000-ton cruisers will start in 1924–25.

"About 13 destroyers are still to be constructed, of which 5 will be completed within the current year. The construction of four intermediate type cruisers, *Naka*, *Abukuma*, *Sendai*, and the *Jintsu*, will be completed in 1924."

JAPAN.

CAUSE OF ACCIDENT TO SUBMARINE "NO. 70."

December, 1923.

During a recent conversation with submarine officers of the Japanese Navy the cause of the sinking of *No. 70* was given as follows:

The submarine was off Kariya, Hyogo-ken, August 21, 1923, for the purpose of an official submerged trial cruise. She successfully performed the trial and then suddenly sank while attempting to rise to the surface.

The accident was due to the opening of the vent valve in the after ballast tank (the first tank emptied) by some unaccountable mistake, after the sea valve was closed, but before the closing of the low-pressure air distribution valve leading to that tank. Thus, the forward and midship ballast tanks which were not yet entirely emptied came in open communication with outside air through the aforesaid low-pressure air distribution valve and wide-open-vent valve in after ballast tank with the result that the forward tanks flooded, thereby causing the vessel to begin sinking by the bow. In addition to this, men engaged in the operation of the low-pressure blower did not know of the premature opening of the after vent valve and thinking the dropping of pressure in the blower was due to the trouble in the blower itself, stopped its operation. This resulted in flooding all tanks, and the water rushed through deck hatches and conning-tower hatch, which were opened too soon and which could not be closed in time. Efforts made to discharge water out of the tanks by means of high-pressure air failed.

An investigation of the cause of the sinking showed that it was not due to an error in designing, faulty construction, nor negligence, but that the below-mentioned faults in handling caused the sinking.

(1) Premature opening of vent valve of the after water tank, while emptying of water in the tank was being effected.

(2) In attempting to empty the main tanks by means of high-pressure air, after stopping the operation of low-pressure pumps, they failed to close the low-pressure air distribution valve.

(3) Opening of hatches too soon.

There remains the question of who will stand for the loss. Under strict interpretation of the laws concerning such cases the builder may be held re-

sponsible because the vessel had not yet been turned over to the navy. But on the other hand, the board of inquiry entirely relieves the builders from the causes of sinking, the fault being in the handling of the vessel by the navy. This will probably lead to complicated legal controversy.

JAPAN.

DAMAGE TO YOKOSUKA NAVAL STATION.

December, 1923.

On November 24, 1923, eight foreign press representatives upon invitation by the Minister of Marine visited Yokosuka. Though not definitely known, it is presumed that the reason for the visit was to show the press what steps were being taken in regard to scrapping ships and to allay any suspicion concerning the change of scrapping plans caused by the damage to the *Amagi*. One of the representatives reported on conditions as follows:

The city of Yokosuka is very badly damaged by fire, but the only fires in the naval station were at the hospital and engineering school, both of which were destroyed.

In the naval station a large percentage of very flimsy old buildings housing machine shops were shaken down, but it is expected that the machinery will be salvaged. A hill slid over on one shop, but the machinery will be used. Another hill fell on some of the paymaster's storehouses, but it is believed that the stores are undamaged. The arsenal building was badly damaged, but again the contents are all right. Nearly all the sea wall around the station is damaged. The naval headquarters building is down and the canal between Yokosuka and Oppama is blocked.

The fuel oil was stored in 18 tanks, of which 8 are completely destroyed and 4 are slightly damaged; the remaining 6 are all right.

Concerning the big dry dock, the gate is slightly damaged, but not out of commission, and some of the masonry is down at the forward part and also on one side. (NOTE.—Several days ago the *Kaga* was placed in this dock preparatory to converting her, so it is not believed the dock can be seriously damaged.)

The small dry docks are all right.

Concerning the *Amagi*, the Japanese say that the forward and the after blocks upon which the *Amagi* was resting sank and that she therefore buckled 2 feet amidships. Informant could see no damage whatever, but stated that the midsection of the keel is about 3 feet off the ground, whereas he expected it should be higher. He could see no signs of any work being done on the *Amagi*. The *Kaga* is being converted.

The building ways are undamaged, also the power house was not hurt.

Informant was told that some old submarines at the station were slightly damaged.

The naval authorities at Yokosuka told informant that damage to Yokosuka amounted to about 65,000,000 yen.

Regarding scrapping of ships at Yokosuka, informant stated:

Mikasa.—Guns and turrets have been removed and considerable work is under way.

Aki.—Two starboard forward guns and turret and also two bow guns have been removed.

Asahi.—Same as *Aki.*

Satsuma.—No indication of anything having been done.

JAPAN.

DATA ON NAVAL PERSONNEL.

November, 1923.

The following tables give the most recent information upon this subject and to a certain extent modify the data in the comparative tables given at the end of the Naval Information Bulletin of January, 1924:

TABLE I.—*Number of officers, commissioned, special service, and warrant officers in the Japanese Navy on October 1, 1923.*

Total executive and engineer	3,679
Total staff	1,085
Total special officers	816
Total warrant officers	1,598
Total number	7,178

NOTE.—Reduction in personnel due to the Washington Conference is not completed, and several hundred included in the above list will be dropped before long.

TABLE II.—*Number in each grade and corps.*

Corps.	Admiral.	Vice admiral.	Rear admiral.	Captain.	Commander.	Lieutenant commander.	Lieutenant.	Sublieutenant (first class).	Sublieutenant (second class).	Total.
Executive	12	13	41	137	314	531	737	315	599	2,699
Engineer	-----	1	12	42	105	191	264	130	235	980
Medical	-----	1	5	17	46	77	122	99	64	431
Apothecary	-----	-----	-----	1	3	1	7	5	4	21
Paymaster	-----	-----	5	22	39	76	126	63	67	398
Construction	-----	1	4	17	8	8	17	10	-----	65
Constructing engineer	-----	-----	3	6	3	3	8	10	-----	33
Ordnance	-----	1	5	5	10	16	53	38	2	130
Hydrographic	-----	-----	-----	1	6	-----	-----	-----	-----	7
Total	12	17	75	248	534	903	1,334	670	971	4,764

TABLE III.—*Special service and warrant officers.*

Corps.	Special service.	Warrant officers.	Total.
Executive	369	764	1, 133
Engineer	333	612	945
Bandmaster	9	11	20
Carpenter	33	52	85
Wardmaster	14	41	55
Paymaster	58	118	176
Total	818	1, 598	2, 414

TABLE LV.—*Distribution of officer personnel on land and sea duty.*

	On sea.	On shore.	Total.
Officers	2, 444	2, 320	4, 764
Special service and warrant officers	1, 582	832	2, 414
Total	4, 026	3, 152	7, 178

NOTE.—Included in the above list on shore duty are 155 officers and 95 special service and warrant officers who are either on the waiting list or the Kyushoku list with half pay.

TABLE V.—*Midshipmen, etc.*

	Midshipmen.	Cadets.		Students in outside schools.	
Executive	259	Executive	393	Medical	67
Engineer	76	Engineer	152	Apothecary	1
Paymaster	37	Paymaster	52	Construction engineer. Ordnance Construction	38
Total	372		597		106

There are no marines in the Japanese Navy. The duties performed by the United States marines ashore in guarding naval establishments are performed in Japan by the ordinary seamen, and these are included in the list "number of petty officers and seamen" under Tables 9 and 10.

TABLE VI.—*Personnel attached to aviation.*

Officers:	
Naval aviators	84
Ground line	35
Special service and warrant officers:	
Naval aviators	1
Ground line	(1)
Petty officers and men:	
Aviators	30
Ground line	(1)

Personnel attached to aviation under instruction.

Officers:	
Aviators	16
Ground line	6
Petty officers and men:	
Aviators	24
Ground line	(1)

TABLE VII.—*Civilians performing duty for the navy.*

Higher civil officials:	
Instructors	39
Experts	193
Hannin rank:	
Employees	77
Clerks	311
Assistant experts	719

NOTE.—The following is a comparison between civil and naval ranks:

Shimnin rank (Emperor's personal appointment)	Admirals.
Chokunin rank:	
First grade	Vice admiral.
Second grade	Rear admiral.
Sonin rank or higher civil officials:	
Third grade	Captain.
Fourth grade	Commander.
Fifth grade	Lieutenant commander.
Sixth grade	Lieutenant.
Seventh grade	Sublieutenant (first class).
Eighth grade	Sublieutenant (second class).
Hannin rank:	
First grade	Warrant officer.
Second grade	Petty officer (first class).
Third grade	Petty officer (second class).
Fourth grade	Petty officer (third class).

TABLE VIII.—*List showing average number of officers and men on board each class of ship.*

Number of ships from which average is taken.	Class of ship.	Average number of personnel on each ship.	
		Officers.	Men.
10	Battleships and battle cruisers	73	1,244
17	Light cruisers	33	414
2	Airplane ships	40	350
3	Destroyer tenders	22	217
3	Mine layers	26	375
10	Coast-defense ships	34	486
14	Gunboats	12	95
76	Destroyers	9	98
28	Submarines	7	35
26	Special service ships	14	149

[1] The number is unknown, petty officers and men being used for the purpose

TABLE IX.—*Distribution of personnel afloat.*

Number of ships.	Class of ship.	Complement.	On board.	Remarks.
10	Battleships and battle cruisers.	12, 442	12, 199	Includes 1 first reserve and 1 second reserve ship.
17	Light cruisers	7, 052	6, 786	Includes 3 second reserve ships.
2	Airplane ships	701	701	Includes 1 first reserve ship.
3	Destroyer tenders	652	652	Do.
3	Mine layers	751	751	Includes 1 first reserve and 1 second reserve ship.
10	Coast-defense ships	4, 861	3, 958	Includes 3 second reserve and 3 third reserve ships.
14	Gunboats	1, 341	1, 192	Includes 1 first reserve, 1 second reserve, and 1 third reserve ship.
76	Destroyers	6, 922	6, 598	Includes 16 first reserve and 18 third reserve ships.
28	Submarines	972	972	
26	Special service ships	3, 877	3, 187	Includes 1 second reserve, 1 third reserve, and 7 fourth reserve ships.
	Total	39, 571	36, 996	

TABLE X.—*Distribution of enlisted personnel ashore.*

Naval stations and offices	443
Hospitals (operating force)	457
Naval barracks	2, 217
Secondary naval stations	397
Aviation stations	2, 342
Defense corps	2, 737
Communications (operating force)	211
Trade schools	1, 374
Total	10, 178

In addition to those shown above there are:

Substitute men at naval barracks	3, 000
Recruits under instruction	6, 500
In hospitals (patients)	1, 300
In prisons or deserters	300

TABLE XI.—*Number of men and class of service.*

	Number.	Term of enlistment (years).
Conscripts	18, 461	4
Volunteers	31, 675	6

TABLE XII.—*First and second reserve.*

	First reserve.	Second reserve.	Total.
Officers, including warrant officers	1,355	464	1,819
Petty officers and men	20,430	9,170	29,600
Total	21,785	9,634	31,419

There are no reserve officers or men in the Japanese Navy on active duty.

JAPAN.

JAPANESE ATTITUDE TOWARD SINGAPORE NAVAL BASE.

December, 1923.

The following is an extract from a Japanese newspaper:

It is believed England will proceed with the construction of a powerful naval base at Singapore, with docks able to accommodate ships up to 45,000 tons, oil tanks of a capacity of 1,000,000 tons of oil, aviation corps, and an immense supply depot. As the place is out of the restricted area as set forth in the naval treaty, England is free to do as she pleases, but the fact remains that the establishment of such a powerful military base in the Orient is considered a menace to Japan.

The national defense plan of our navy as explained by the then minister of the navy, Admiral Kato, is that "we had no particular imaginary enemy in view in framing this, and is done so only taking into consideration the condition of affairs around the Empire, and considering the extent of naval forces the other powers may be able to send to the Orient."

Whatever the motive of England may be, the conditions on which our plan was based are entirely upset. The fact that Singapore and Hawaii were not included in the restricted sphere was adversely commented upon after the conference, and we now see the mistake we made materializing in this shape.

Our navy department is gravely concerned about it, and is seriously studying the question. It not being in conflict with the terms of the treaty, we can not protest against it. Since the British Government has decided about it, it will do no good to ask her to come to some understanding to avoid it, and thus they are wondering what we can do in a way to mitigate the menace. Since we can not afford to overlook the matter from the standpoint of our "national safety" some course will have to be worked out, conferring with other branches of the Government as the affair progresses.

NOTE.—This question has not been given much prominence, but occasionally articles like the above appear. I believe the authorities feel that this is contrary to the spirit of the Washington agreement, and that the project is strongly resented in Japan.

JAPAN.

JAPANESE NAVAL CHARACTER IN THE EARTHQUAKE EMERGENCY.

December, 1923.

During the recent great calamity of earthquake and fire in and around Tokyo and Yokohama, the greater part of the Japanese naval strength was concentrated off these two cities. Due to my em-

ployment as liaison officer between our fleet and the Japanese naval forces afloat and ashore. I had an unexampled opportunity to observe the reaction of the Japanese naval character to an unusual and unprecedented emergency.

At the time of the catastrophe, although the Japanese Navy was comparatively close at hand and was able to move, the concentration of these forces proceeded with maddening slowness and ineffectiveness. No ships, so far as I was able to learn, began the loading of such relief stores as food and medical supplies and equipment, the need of which experience and a fair knowledge of the facts must have been made apparent. The ships simply arrived—most of them with hardly enough supplies to take care of their own crews, so that they were of little use with the exception of merely transporting the refugees, and even this was not undertaken with any degree of promptness or with sufficient force to make for effectiveness. The slowness of these movements is evidenced by the fact that there was no great concentration of ships from points in Japanese waters until just about the time the *Huron* arrived from Dairen.

These conditions seem to have been brought about by the lack of ability to grasp the situation, the lack of authority or decision to act, a misconstruction or distrust of all foreign help, including that offered by ourselves, a harmful secretiveness which attempted to conceal as much as possible the actual facts, and an inability to break away from established forms of etiquette which caused the loss of much time.

When news of the great disaster began to go out, the Japanese admiral afloat should have been the best informed man in the world, outside of the affected area, as to just what was happening in the capital. This must be true, as the navy wireless station erected over the navy department in Tokyo was unharmed and continued to function for the 48 hours during and immediately after the earthquake, so it is reasonable to suppose that the admiral must have had the fullest possible information as to the situation. In spite of this fact he was slow to act, and when his ships did arrive, with the exception of a few of the smaller craft, they were not in a position to render any immediate and effective aid. No action seems to have been taken by him for the immediate transportation of such materials as would be useful in alleviating the sufferings of the thousands of injured and the tens of thousands of miserable homeless people facing death by starvation and disease. This action on his part could only have been brought about by his complete failure to grasp the situation, or by his unwillingness or fear to take any drastic action in the absence of detailed orders from the navy department. This trait of lack of commensurate authority to act seemed to prevent the taking of anything but routine action regard-

less of the circumstances. At one time I was sent to make arrangements for the handling of the United States Army transport *Somme*. A manifest of cargo and the general dimensions of the *Somme* had been handed to Rear Admiral Kobayashi, the Japanese officer in charge of the disposition and handling of all vessels carrying relief supplies. Two days later I went over to ask him where he desired the *Somme* to berth. He asked for particulars, which I furnished him, the same as had already been sent. He considered for a minute or two and then finally told me that he would let me know in the morning, as he would have to wire to Tokyo for instructions. Tokyo had already been notified of the facts, and the fact that instructions were not issued may be criticized, but the outstanding criticism seems to me to be that, under the conditions, detailed instructions were necessary for such an officer.

At first neither our presence nor the help we brought was gratefully or even courteously received. This may be attributed to two reasons; one of them to my mind a very proper one. They feared that we would come in the usual wholesale American way, land forces, take over and repair railroads, administer relief, and, in fact, run practically all relief work and as much of the country as possible. It is only natural that they should resent anything of this nature, and their extreme fear that this might occur, led them to receive us very coldly and rather than facilitate, to hinder our work. This obstacle was removed upon the arrival of our commander in chief, who immediately made it plain to them that we were here simply to lend a helping hand in any way we could without interfering in any way with their handling of the situation. The other factor which brought about this feeling of distrust is not so easy to account for. The Japanese seem to have been obsessed with the idea that they had reason to fear attack, especially from us. Many of their ships which could have been used to good advantage in relief work were kept patrolling the entrance to Tokyo Bay and the adjoining coast waters. When one of our destroyers went to Kamakura, a light cruiser followed her and observed her operations in taking off refugees without offering to help. The same was true of the destroyer which went to Odawara. In short, whenever a foreign man-of-war got under way and stood out, within 15 minutes a Japanese patrol vessel would stand out to keep her in sight and watch her movements. These movements were in addition to the patrols kept offshore at all times. The only explanation as to why they should have feared attack must be based on their psychology. According to an old resident who is well versed in Japanese ways, the Japanese character after a severe disaster or in a crisis tends to fear that an unfair advantage will be taken of its

plight, so looks on everyone as a possible enemy and takes counter measures accordingly. This same man asked me soon after our ships had arrived, "Say, where is the Japanese Navy?" When I told him that I did not know, he said: "You know it wouldn't surprise me a bit if one of their reactions to this thing wouldn't be a fear of attack from us, and I should not be surprised if their whole navy isn't out patrolling the entrances to the bay ready for an attack."

Throughout the emergency and even now every effort was made by the Japanese authorities to prevent the obtaining of any accurate information as to the extent of the disaster, and in the official proclamations the loss of life and property was minimized as much as possible, the commanding general of martial law even going so far as to suggest that no one from our forces should go to the devastated districts, saying that the temper of the people made it dangerous. This was rather overdrawn, to say the least, as at this time numberless hordes of people whose only interest was to see the destruction at first hand and to take pictures, etc., were permitted to enter the city and do their sightseeing without hindrance. Why this secrecy was maintained even in the face of the fact that this information would only increase the world-wide sympathy and add to the relief so sorely needed is not clear, unless we realize that the Japanese tend to make a mystery out of themselves and that this habit of secrecy was simply too strong to be broken, even by a disaster of the first order.

The habit of etiquette and of doing things according to customary and accepted forms is so strongly imbedded in the Japanese official character that they were unable to rise above these forms even when they became a hindrance, causing prolonged suffering to their countrymen. This trait was fully illustrated to me when the chief of staff of the senior Japanese naval officer in Yokohama showed me the correspondence and time required to get permission to use our destroyers to carry refugees from Yokohama after we had already offered these services. Instead of simply accepting us and putting us to work, as we expected, the Japanese admiral sent a letter to the navy department requesting information as to the proper method of formally asking for aid. The navy department forwarded the admiral's letter to the foreign office, requesting advice; the foreign office sent these letters to the advisor to the foreign office, Mr. Frederick Moore, who advised them that the proper method was a request to our embassy through the foreign office. This was then sent to the foreign office to the navy department, who forwarded it to the admiral. Upon receipt of this information, the admiral addressed a letter to the navy department requesting our aid. This was where

the matter stood when I saw the correspondence. The admiral's last letter had been sent two days before, and four days later we received the request for aid, so that at least a week or 10 days must have elapsed since the original request. All this formal letter writing was taking place while the poor people concerned were living in the most wretched condition imaginable, exposed to the elements and with very little food and water. So weak were they by the time we took them aboard that many had to be carried over the side. All this could have been avoided by a simple request to our commander in chief; but no, the other way was the proper and the approved method and so it must be carried out regardless of earthquake, fire, and human misery.

The above is not intended to convey the idea that the Japanese naval character is so lacking in the essential traits as to be worthless. Such is far from true, as they have unbounded courage and determination; and once their system gets to running smoothly, a great deal is accomplished. I have only attempted to point out some of the outstanding points of failure during emergency, which were apparent during the recent crisis.

JAPAN.

MISCELLANEOUS NAVAL NOTES.

December, 1923.

[From the Japanese press.]

PRINCE KAN-IN TO VISIT AMERICA.

Prince Kan-in will be sent to the United States as special envoy to express thanks to the United States for their sympathy and aid in the recent earthquake disaster. He will leave Japan shortly after the royal wedding takes place and the light cruiser *Isuzu* has been decided upon as the ship to carry him and his party. (Prince Kan-in is field marshall (gensui) and is the honorary president of the Japanese Red Cross.)

NOTE.—It is believed that this press report was given out by the imperial household for the purpose of sounding out opinion in the United States and Japan. No official announcement has yet been made.

BOARD OF INVESTIGATION ON SINKING OF SUBMARINE "NO. 26."

The board of investigation on the sinking of submarine *No. 26*, finished their investigation on November 19, and the submarine was taken from dock No. 1 to the pier of Torpedo branch, where a change of batteries and necessary repairs are to be made, which is expected to take about three months.

The findings of the board was reported to the commander in chief, Admiral Suzuki, and it is expected that a court-martial will be ordered.

The same board will also investigate the causes of the sinking of submarine *No. 70*.

NOTE.—No details of the findings of the board have been obtained.

SUBMARINE NO. 59 SUCCESSFULLY PASSES SUBMERGED TEST.

The newly constructed submarine *No. 59* has successfully passed her submerged cruise off Kyushu, and the result has satisfied the authorities concerned.

The submarine succeeded in cruising at a depth of 150 feet, which would have crushed the vessel on account of the water pressure but for the special contrivance of the imperial navy's originality, according to the authorities statement.

The submarine also successfully passed the test of cruising for 8 consecutive hours submerged.

NOTE.—It is not known what the special strength contrivance is except possibly a newspaper man's imagination.

FORMER COMMANDING OFFICER OF SUBMARINE "NO. 70" PLACED ON WAITING LIST.

Lieutenant Ikeda, formerly commanding the ill-fated submarine *No. 70*, was placed on the waiting list.

TWO COMMANDING OFFICERS TO BE ATTACHED TO A SUBMARINE.

On account of the large number of accidents to Japanese submarines, it has been decided to have two commanding officers to a submarine. This experiment is to be tried out on submarines *No. 25* and *27* of the eleventh submarine division, beginning December 1, 1923.

SCARCITY OF MEN FOR SUBMARINE DUTY.

The Japanese Navy is having a difficult time in getting enough men for duty on submarines. As the navy has now under construction more than 10 submarines, several of which are to be completed by April, 1924, and to be attached to the second submarine flotilla of the standing fleet, in order to fill the complements of these submarines when completed, they are planning to double the complements of the training submarines, but they are having difficulty in obtaining men for this duty, due to the objection of the parents having their sons placed on submarine duty on account of the large number of accidents to submarines.

In the old type submarines, only those were accepted for submarine duty who did not smoke or drink, but at present these restrictions are no longer in effect.

In the cases of submarines *Nos. 26* and *70*, investigations disclosed the fact that accidents to these submarines were not due entirely to unavoidable circumstances, but that human faults such as lack of skill and lax discipline were partly responsible for the accidents. Since then strict orders have been issued by the authorities that the watch duty of flotilla commander and commanding officer should be kept up even while the submarines are tied up in a harbor.

LANDING AND TAKING OFF PRACTICE FROM AEROPLANE CARRIER.

The Japanese Navy has to date made only 7 flights from an airplane carrier. All of these flights were made by Lieutenant Kira, who is now abroad studying aeronautics. These flights by Lieutenant Kira were made following instruction by an English instructor.

Since then, the aviation corps at Oppama have been conducting experiments with an imitation deck built on land, Sublieutenants (First Grade) Baba and Kamei, being the two aviators taking part. They have become quite confident of their ability and are to make flights from the airplane ship *Hosho* some time in the middle of December, selecting favorable weather for the occasion.

AERIAL TORPEDO BOMBING PRACTICE.

Aerial bombing practice will be held in Yokosuka Harbor December 5, 1923, the 1921 model bombing plane, attached to Kasumigaura naval air station will be used for this purpose. High officials and experts from Tokyo will witness the practice.

Torpedoes to be used in this practice will be much larger size than heretofore and the fact that both airplane and torpedoes are for the first time being used in Japan for this purpose is attracting a great deal of interest among naval men.

NOTE.—No details of the torpedoes or plane mentioned above have yet been obtained.

POWERFUL MOTOR FOR AIRPLANES.

The Nagoya machine works has for some time been working on designing a 600-horsepower motor for use in the bombing airplanes, but also adapted for use in the reconnoitering and battle planes. The design has been completed and construction on the motor will be started and will be completed about March, 1924. This will be the most powerful motor for airplanes ever built in Japan. When the motor has been constructed it will be installed on a training plane

built by the Nagoya Arsenal and will be tried out in flights at Kagamiga-hara army aviation grounds. Owing to the fact the design is entirely of Japanese make it is attracting a great deal of interest on the part of Rear Admiral Sasamoto of the Nagoya Arsenal and the others concerned. The design is being kept secret.

LIGHT CRUISER "JINTSU" LAUNCHED.

The light cruiser *Jintsu* (5,595 tons) was launched at Kawasaki Dock, Kobe, December 8, 1923. She is sister ship to the *Kinu*, and has an armament of seven 5-inch guns, speed 33 knots. She will be attached to Kure when put in commission.

REPAIRS TO LIGHT CRUISER "OI" COMPLETED.

The light cruiser *Oi*, which has been undergoing repairs, went out December 15 for a trial run and returned to port the same day. She will leave Kure on December 27, 1923, for Bako.

NEW GUN FOR LIGHT CRUISERS.

The gun factory at Kure naval station built a double-barrel gun of 14.54 cm. caliber diameter at muzzle, and is trying it out at Kamega-kubi experimental grounds. The double barrels are built in such a manner as to make it appear like a single barrel.

It is thought that this gun will increase the efficiency of the light cruiser, and if successful, it is planned to mount this type of gun on all light cruisers.

ALTERATIONS TO "HARUNA."

The battle cruiser *Haruna*, which has been used as training ship for the gunnery school, is to undergo alterations allowed by the terms of the naval treaty. These alterations are to be done at the Yokosuka naval station in the early spring, and the *Fuso* is to take the place of the *Haruna* as training ship for the gunnery school.

NOTE.—According to the press this is the first ship to be altered in accordance with the alteration program. As it now stands the alteration program is to be completed in 1936. The naval authorities insist the date of completion should be 1931 and a change in date may subsequently be made.

ALTERATION OF CAPITAL SHIPS.

In the matter of postponement of the completion of alterations to capital ships the finance department insisted that the original date of 1930 should be postponed to 1936. The Minister of Marine contended that 1931 should be the latest date of completion if the navy was to gain the benefit of alteration work before the ships reached their age limit. His argument also considered the fact

FORT NO. 3 TOKYO BAY.

Before the earthquake.

FORT NO. 3, TOKYO BAY.

After the earthquake.

that in 1931 a replacement program would be instituted and that the alteration work was necessary to Japanese naval strength until such time as replacement was effected and that there was no wisdom in the dates for completion of alteration and beginning of replacement being coincident.

The navy, however, was obliged to acquiesce as the matter now stands. The budget to be presented to the Diet for 1924 contains a provision for 1936 as the date of completion of alterations to capital ships. The navy will probably attempt in the Diet to have this date changed to 1931.

PROGRESS OF SCRAPPING AT YOKOSUKA NAVAL STATION.

Scrapping at Yokosuka naval station has progressed as follows:

Asahi.—Removal of turrets, armor plates, and most of the first period of scrapping will be completed by December 31, 1923. She will then be used as a special service ship, towing targets for the Naval Gunnery School.

Aki and Satsuma.—Scrapping of the interior is proceeding, such as engines, etc. It was intended to use these ships as targets for the *Mutsu* and *Nagato* this fall, but due to the recent disaster these plans were changed and it is now intended to use these two ships as targets in the Gulf of Tokyo in October, 1924.

Mikasa.—Removal of armor plates has been begun.

It is planned to complete the work on the *Aki* and *Mikasa* by the middle of January, 1924, and that on the *Satsuma* by the end of January, 1924, so that the work of first period of scrapping will be completed well ahead of the date stipulated in the treaty, February 16, 1924.

NAVAL CONSCRIPTS FOR SASEBO.

Two thousand four hundred and thirty-two naval conscripts entered the naval barracks at Sasebo on December 1, 1923. Compared with last year, it is an increase of almost four times.

NAVAL VOLUNTEERS FOR KURE.

During the fiscal year, 1924, 6,500 naval volunteers are to be accepted by Kure. Examinations will be held from January to April, 1924, and the recruits will enter the barracks in June, 1924.

NAVAL ENGINEERING SCHOOL TO MOVE.

The Naval Engineering School will move to Edajima. The Naval Engineering School at Yokosuka was destroyed by the earthquake and fire of September 1, 1923, and temporarily moved to Edajima.

It has now been decided that the school will permanently remain in Edajima, with the exception of the training course, which will be at the dockyard.

NAVAL ACADEMY TRAINING SHIPS.

The *Tenriu*, which hitherto served as training ship for the Naval Academy will be transferred to the fleet in December, and the *Tuma* and *Kuma* will be used in her stead as training ships.

THIRTIETH DESTROYER FLOTILLA RELIEVED.

The thirtieth destroyer flotilla, consisting of the *Wakaba*, *Ushio*, *Nenohi* and *Asakaze*, which were stationed at Ryojun have been relieved and sailed November 25, 1923, for Sasebo.

TORPEDO BOATS AND DESTROYERS TO BE PUT OUT OF COMMISSION.

The following torpedo boats and destroyers are to be put out of commission next April:

Destroyers: *Shirayuki*, *Nowake*, *Matsukaze*, and *Arare*.

Torpedo boats: *Kiji* and *Otori*.

10,000 NAVY-YARD WORKMEN TO BE DISCHARGED IN 1924.

Ten thousand navy-yard workmen are to be discharged in 1924. The navy, owing to the big cut in the budget for 1924 will discharge 10,000 men from navy yards and navy arsenals.

The discharged men are to receive the same rate of discharge allowance as those men discharged on account of naval limitation; 6,000,000 yen will be required for this purpose and this estimate has been submitted to the finance department, which when approved will be presented to the Diet as the supplementary budget, together with the expenditure for scrapping ships of 11,000,000 yen. The allowance to be paid the discharged men is to be paid in Government bonds.

JAPAN.

NAVAL AVIATION PROGRAM.

December, 1923.

The following is taken from the Japanese press. The correctness of the figures is not known:

Kaspmigaura.—6 corps, 48 airplanes; 1 corps, dirigible.

Yokosuka.—2½ corps, 20 airplanes; 1 corps, balloon corps.

Sasebo.—1½ corps, 12 airplanes.

Omura.—½ corps.

According to the present program, by the fiscal year 1927, the forces will be:

Kasumigaura.—7 corps, 56 airplanes; 1 corps, dirigible.

Yokosuka.—5 corps, 40 airplanes; 1 corps, balloon corps.

Sasebo.—3 corps, 24 airplanes.

Omura.—2 corps, 16 airplanes.

The ordinary account of 1923 naval budget is 16,000,000 yen. In the 1924 budget 1,700,000 yen was requested in the extraordinary account for establishment of flying grounds, but due to the decrease in the "Expenditure for land and sea equipments," this was reduced to 1,000,000 yen.

JAPAN.

NAVAL EXPENDITURES.

December, 1923.

The following statement on naval expenditures was received from the Minister of Marine through the foreign office on November 27, 1923:

The amount of naval expenditures for the fiscal year of 1923 was fixed at 239,000,000 yen, by reducing 3,000,000 yen from the proposed estimates, totaling 278,000,000 yen, and carrying forward 36,000,000 yen to the next fiscal year. In the expenditure for warship construction for the equipment on land and water and for warship construction, 250,000,000 yen, 4,000,000 yen, and 1,000,000 yen in round figures were carried forward to the next fiscal year, respectively.

The estimates of naval expenditures for the fiscal year of 1924 amount to 238,000,000 yen, to be divided into 126,000,000 yen for ordinary account and 112,000,000 yen for special account.

In the former account, some 4,000,000 yen has been decreased through reduction in the expenditure for scrapping warships and economy in various other items; while the expenditure for the reconstruction of warships under the already fixed program and for the maintenance of naval aviation corps and for other items has been increased by about 5,000,000 yen.

The reductions noteworthy in the latter account are 88,000,000 yen in warship construction expenditure, 13,000,000 yen in the expenditure for land and water equipment, and 2,000,000 yen in the expenditure for warship reconstruction.

Altogether, the grand total of both ordinary and special account for the fiscal year 1924 shows a decrease of 40,000,000 yen and 1,000,000 yen, respectively, as compared with the proposed estimates and the working estimates for the fiscal year of 1923.

Estimate of loss suffered by the Japanese Navy through the recent earthquake and fire.

	Yen.
1. Tokyo	20,000,000
2. Yokosuka and vicinity	68,500,000
3. Hiratsuka and vicinity	3,000,000
Total	91,500,000

NAVAL EXPENDITURES.

The following extracts were taken from the Japanese press. The question of the restoration budget has not been settled and while the following figures are subject to change, they are submitted as of possible value in indicating the trend of the situation:

The naval restoration budget which has been under preparation for sometime and which was submitted to the department of finance on November 20, 1923, is are follows:

	Yen.
(1) Arms and stores held by naval store depot, Yokosuka, and naval technical laboratory, Tokyo, also buildings attached thereto	55,000,000
(2) Heavy oil and tanks	3,400,000
(3) Buildings occupied by higher naval college, engineering school, paymaster's school, medical school, including Yokosuka Naval Hospital, equipment, and medicines, Yokosuka naval barracks, Yokosuka naval station, etc	34,000,000
(4) Relief supplies distributed (provisions, blankets, tents, etc.)	5,000,000
Total	97,400,000

This is to be appropriated under a continuing expenditure lasting five years, 1924–1928. It is expected that the above amounts will eventually be cut down by the department of finance.

Restoration budget covers restoration of buildings, arms, and stores that were destroyed by the earthquake, also replacement of stores that were distributed for the relief of the earthquake sufferers. The principal items are:

	Yen.
Buildings and arms	75,000,000
Crude oil	2,500,000
Oil tanks	1,300,000
Stores for relief of earthquake sufferers	5,000,000
Estimated total	101,000,000

This is to be appropriated under a continuing expenditure lasting six or seven years, and the part for the next year is expected to be asked as the additional budget.

JAPAN.

NAVY REQUESTS ADDITIONAL CREDITS FOR SPECIAL PURPOSES.

December, 1923.

According to the Japanese press, the navy is said to have requested the treasury in the strongest manner to include the three following expenditures in the supplementary budget, which reckons the expenditures of new undertakings for next year:

(1) The indemnity to be paid to shipbuilders for the cancellation of orders for the construction of war vessels, done in accordance with the naval treaties. The indemnity is estimated by the navy

office at 30,000,000 yen, for which payment the navy office requires the treasury to issue public loans. The treasury doubts the accuracy of the estimate, though it does not object to the necessity of the indemnity itself, and is reserving its assent until the investigation which it is now undertaking is completed.

(2) As a result of the 20 per cent reduction exercised upon the building expenditure of war vessels, over 10,000 workmen will be dismissed from the arsenals, to whom discharge allowances must be given. The navy office estimates the sum at 5,000,000 yen.

(3) The navy office has to share some part of the losses sustained by private concerns, through damage of goods ordered for the navy, caused by the recent earthquake. The office is, of course, free from any such duty from the legal point of view, but there exist many reasons at present which are above simple talk of legality.

The above expenditures, however, are of the nature common among all offices of the ministry, except that of the cancellation indemnity, and so they are liable to arouse much discussion at the coming Diet. For that reason, the navy office is said to be acting most scrupulously with regard to these requests.

JAPAN.

PROSPECTIVE DATES OF COMPLETION OF NAVAL VESSELS.

December, 1923.

The following information, while not from the navy department, bears the official stamp of the navy department:

Anticipated dates of completion of warships and vessels under construction.

CRUISERS.

Abukuma	Apr., 1924	Furutaka	Nov., 1924
Jintsu	July, 1924	Sendai	May, 1924
Naka	Unknown.	Kako	——, 1925

DESTROYERS.

No. 7	Apr., 1924	No. 11	Apr., 1924
No. 13	Unknown.	No. 15	May, 1924
No. 9	Aug., 1924		

SUBMARINES.

No. 44	Apr., 1924	No. 71	June, 1924
No. 51	Dec., 1924	No. 72	Jan., 1924
No. 58	Mar., 1924	No. 73	May, 1924
No. 62	Nov., 1923	No. 74	——, 1925
No. 69	Apr., 1924	No. 75	——, 1925
No. 70	Unknown.	No. 84	July, 1924

AIRCRAFT CARRIERS.

Kaga	Unknown.	Akagi	Unknown.

SUBMARINE TENDER.

Chogei	Nov., 1923

SPECIAL SERVICE SHIPS.

Naruto	Nov., 1923	Mamiya	Dec., 1923
Hayatomo	Nov., 1923		

JAPAN.

REORGANIZATION OF FLEET.

December, 1923.

Herewith is the official list showing the new organization of the Japanese fleet as of December 1, 1923, together with ships which are expected to join the fleet during 1924:

First fleet:

First division: *Nagato, Mutsu, Hyuga.*

Third division: *Tama, Isuzu, Yubari.*

First destroyer squadron (*Tenryu*):

Thirteenth division: *Nos. 4, 6, 10.*

Fourteenth division: *Kawakaze, Tanikaze, Kiku, Aoi.*

Fifteenth division: *Hagi, Susuki, Fuji, Tsuta.*

Sixteenth division: *Nos. 16, 18.*

First submarine flotilla (*Chikuma, Jingei*):

Fourth division: *Nos. 28, 29, 30.*

Sixth division: *Nos. 46, 47, 57.*

Second fleet:

Fourth division: *Kongo, Hiyei.*

Fifth division: *Yura, Natori, Nagara.*

Second destroyer squadron (*Kitagami*):

First division: *Nokaze, Numakaze, Namikaze, No. 1.*

Second division: *Minekaze, Sawakaze, Okikaze, Yukaze.*

Fourth division: *Hakaze, Akikaze, Tachikaze, Hokaze.*

Fifth division: *Nos. 3, 5.*

Wakamiya, airplane carrier is assigned to second fleet.

First foreign service squadron:

Tsushima, Ataka, Uji, Fushimi, Sumida, Seta, Katata, Hira, Hotsu, Toba.

Training squadron: *Asama, Iwate, Yakumo.*

The following changes are contemplated during 1924: *Yamashiro* to be assigned to the first division. Special service division will be established in May, 1924, to be assigned to the first fleet, to be composed of the *Tokiwa* with first mine sweeper division, composed of mine sweepers *No. 1*, *2* and *3*.

Sendai to be assigned to the fifth division in July, 1924.

Beginning April, 1924, the second submarine flotilla consisting of two divisions, to include new submarines now under construction will be organized, to be attached to the second fleet. *Hirato* will be flagship and *Karasoki* will be tender.

Tsushima will be relieved from China fleet (first foreign service squadron) in April, 1924.

Tone will be assigned to China fleet (first foreign service squadron) in April, 1924.

Iwate will be relieved of the training squadron in June, 1924.

Idzumo will be assigned to the training squadron in June, 1924.

NOTE.—The names of the submarines to compose the second division has not been learned. It is not known why the *Hosho* was not included in the above. Newspaper reports put her in the first fleet.

JAPAN.

SPECIAL NAVAL LEGISLATION.

December, 1923.

The following extract was taken from the Japanese press; it is not known how much truth the statement contains, but it is felt that the prospects of the navy obtaining at this time such an annual appropriation are very small.

The naval authorities are credited by the vernacular press with an intention of legislating the naval fleet act, for the consolidation of the naval foundation, so as to authorize the Government legally to estimate a certain fixed amount of expenditure required for the purpose.

The proposed legislation was considered as early as when the late Viscount Kato, head of the preceding ministry, held the post of the Minister of the Navy, but was prevented from substantialization owing, among other factors, to the annual growing increase of naval expenditure, which rendered it impossible to estimate any fixed amount annually. Since the conclusion of the naval agreement at Washington, however, the authorities have come to find a proper opportunity for the realization of the long contemplated fleet act.

The expenditure for the construction or conversion of warships is under existing law placed on the extraordinary account, and therefore is subject to greater possibility of retrenchment, whenever financial situation demands than the expenditures placed on the ordinary account. In the authorities'

estimation this sort of naval expenditure ought to be treated as an ordinary, not extraordinary, account, since it is estimates for nothing but the maintenance of a certain standard of naval strength.

One of the salient features of the proposed fleet act will thus be the conversion of the warships construction expenditure from the extraordinary into the ordinary account in the Government's annual budget. This will mean the investment of the naval authorities with the right of demanding annually such fixed estimates for the navy as to enable them to maintain a certain fixed standard of naval strength under all circumstances.

JAPAN.

SUBMARINE SCHOOL AT KURE.

December, 1923.

This school is an institution more in name than in fact. The headquarters are located in an old hull of a cruiser and the school building consists of a small shed with several lecture rooms, a battery room containing a battery taken from the *U–146* and an engine taken from the same boat. No other equipment for intructional work was seen except a Sperry gyro compass and diagrammatic charts on the walls of the lecture room. We were conducted through the school by the vice president, a captain who has served 17 years in submarine service, was in England to take over the surrendered German boats, and made a patrol trip on a British L-type boat. A lieutenant who also accompanied us served five years in submarine service, cruised from England to Japan in a German boat and recently returned from the United States where he studied at Princeton for two years.

After showing us the aforementioned sheds, these officers explained that they really have no school, that one is in process of construction to be completed in April, 1924, and that in the meantime practically all instruction work is carried out aboard the submarines. The torpedo instruction is given at Yokosuka.

We were then taken by motor launch alongside the submarines attached to the station and invited to go aboard the submarine *No. 25*. I declined this invitation. A description of the submarine will be the subject of a special report.

At the submarine school there are submarines *Nos. 22, 24, 25, 26 27, 34, 35, 36,* and *37*, two old cruisers and the light cruiser *Kuma*, also six old destroyers. These ships are used as targets for training purposes.

The school staff consists of an admiral for president, a captain for vice president and 11 instructors. The students consist of 10 officers and 120 enlisted men for both of whom the course is six months.

After looking at the submarines we returned to the hulk, where the captain has very comfortable quarters. He served refreshments and seemed inclined to draw me out on submarine conversation. We have both had considerable experience with submarines, both of us were at Harwich to inspect the surrendered German boats; we met there several times, we both patrolled during the war in British submarines and we both are interested in submarines, and since we had considerable in common we had a very frank discussion. He is considered a Japanese submarine expert and he takes considerable pride in it. His hobby is high-speed submarines and he has no prejudice against steam propulsion.

He told me that he has no satisfactory method of teaching officers the method of attack, that unfortunately the model attack teacher which was brought from England was destroyed by fire at the Tokyo experimental station. As a substitute he simply has officers take station at a periscope in a submarine and the principle of attack is taught. The British attack teacher is the method used. This officer was the only one of several that admitted a liking for submarine service. The other officers said they disliked it, that it is generally unpopular, and that detail to the duty is by request or selection, but since volunteers were few it was mostly selection.

The captain told me that there are no submarine mine layers in the Japanese Navy, but that one may be built and that he thought the *V–124* was the best. He said that a small gun on a submarine was useless. Herewith are some of the points upon which he informed me:

(1) Nearly all Japanese submarines have six 18-inch torpedo tubes. The navy type submarine, which is a modification of a French and German type, has four bow tubes and two tubes in the superstructure forward; one on each bow inclined at an angle of 15° to the center line. The L-type which is the British L-type have generally four bow and two beam tubes.

(2) Submarines in general carry one spare torpedo for each tube.

(3) No submarines now built have a gun larger than an 8 centimeter antiaircraft gun, except *No. 68* which has a 4.7-inch gun.

(4) The submarine torpedo is 18 centimeters in diameter, weighs seven-tenths of a ton when ready for a war shot, has a range of 6,000 meters and a speed of 38 knots for the first 400 meters.

(5) Practically all boats are equipped with the oscillator, the K-tube, and about a 10 kilowatt radio set.

(6) Fire control is from bridge, conning tower or torpedo room.

(7) They have difficulty in maintaining depth while firing and do not use any torpedo compensating tanks, but rely on speed and rudders for control subsequent to firing.

(8) Japanese boats crash dive in two minutes but the crash dive is only used as a special drill.

(9) Boats are tested to 150 feet.

(10) The navy-type submarine which is built at Yokosuka, Kure, Sasebo, and Kawasaki dockyard, Kobe, is well liked. The L-type submarines are built at Mitsubishi dockyard, Kobe. The Fiatt type of which they have five, viz, *18*, *21*, *31*, *32*, and *33*, are considered no good.

(11) The boats are fitted with a Sperry gyrocompass, and it always goes off in a seaway.

(12) The method of fuel-oil compensation is to adjust the ballast in accordance with a table for the amount of oil used and they have no automatic fuel oil compensating arrangement.

(13) For purposes of school instruction two submarines make practice dives every other day from 9 a. m. to 4 p. m.

(14) The personnel are very skeptical about submarine service since the accident to *No. 26* and *No. 70*, and since No. 70 minus 26 leaves 44 they are superstitious about *No. 44*.

(15) They have occasional trouble with battery gas.

(16) They very seldom operate at night.

(17) They have had little experience in war games with the fleet or experience in extended cruises.

JAPAN.

VISIT TO KOBE DOCKYARDS.

December, 1923.

The Mitsubishi yard in Kobe is building three British-type submarines of about 1,500 tons submerged displacement, 20 knots surface speed, six bow tubes. They are *Nos. 72*, *73*, and *74*. *Nos. 72* and *73* are almost complete, and *74* will be launched in about two months. Three more submarines, numbers unknown, may be built here.

The Kawasaki yard, Kobe, has three submarines launched. They are probably *Nos. 69*, *70*, and *71*. Three other submarines, probably *Nos. 52*, *84*, and *75* are building, and two more, numbers unknown, may be built there. The Kawasaki boats are Italian type. About *No. 52* there may be a mistake, in which case *84* and *75* are the only boats on ways at Kawasaki.

It is believed all the above-mentioned boats are about the same tonnage, 1,500 submerged, except the *No. 69*, which is about 1,000 tons submerged.

At Kawasaki yard the light cruiser *Jintsu* (5,595 tons) is ready for launching, and the *Kako* (5,550 tons) has just been laid.

Recently the Mitsubishi and Kawashi dockyards at Kobe, Japan, were visited for the purpose of obtaining information on submarines building there. Permission had been obtained from the Japanese navy department for this visit, but no specific request had been made to see submarines.

Upon calling at the Mitsubishi dockyard, we were introduced to representatives of the firm and also to the naval inspector. After the usual exchange of courtesies, we proceeded to inspect the yard, escorted by the naval inspector and an interpreter.

The naval inspector asked what I wanted to see, and I said I was most interested in seeing anything pertaining to naval work; whereupon he continued to waste his time and mine by showing me the carpenter shop, restaurant, etc. Having had previous experience in visiting dockyards and being shown the hospital and workshops where nothing of naval interest can be seen, I resolved not to leave this dockyard with the inspector entertaining a feeling that he had put anything over by his cleverness in making me believe I had seen anything, so I told him that I had seen enough of that part of the yard through which I was being conducted, and I politely requested to be shown the naval work. This was somewhat of a surprise to him, and he was a little embarrassed to know what to do about it, for the fact was that no naval work was in progress except submarine construction. The inspector finally told me he could not show me anything about submarines, or even discuss them. We were both at an understanding then, and as nothing further was to be gained, I took my departure after the usual exchange of courtesies.

The afternoon of the same day we visited the Kawasaki Dockyard. The naval inspector did not speak English and asked if we spoke Japanese. The inspector was extremely pleasant and cordial. He said immediately that he would be glad to show us everything except work pertaining to submarines, but that he was not allowed to give anyone, even visiting Japanese naval officers, any information on submarines.

However, we were taken through the yard to the building ways of the *Jintsu*, which was scheduled to be launched on November 24, 1923. The inspector stated that the *Jintsu* is of 5,595 tons displacement, and that the *Kako*, which has just been laid, is a sister ship, but due to a difference in airplane arrangements forward, she will be 5,550 tons. He said the *Kako* will be launched the last of next year. Also he stated that the 10,000-ton cruisers will be built at naval dockyards. I did not really see very much of the *Jintsu* for

I was busy sizing up some submarine construction on the neighboring building ways. I saw there two submarines, one of considerable size. The inner hull was complete and the outer hull frames were being placed. I believe this is *No. 84* (about 1,500 tons submerged). On the ways next to it a submarine was in the early stages of construction; the frames for the inner hull were being placed. I believe this submarine is *No. 75*, and though I could not well judge, still I surmise it is a 1,500-ton submerged type. Next to that submarine a keel had been laid which I think is a submarine and surmise it is *No. 52*, though there is doubt about this.

The next day I learned that an American merchant vessel was undergoing boiler repairs at Mitsubishi and tied up near the submarines building there, so I made arrangements to go to that ship presumably to inquire about the progress of her repairs.

I drove to the Mitsubishi yard, walked right through it, passing the submarine building section, and finally arrived at the merchant vessel which was tied up alongside a dock just ahead of a big submarine. As I walked by the submarine I took in as many details as possible without appearing to be too interested.

From on board the vessel I obtained a good view; in company with one of the ship's officers. This man became very interested in helping me to obtain submarine information. He told me the submarine foreman of the yard is very friendly with him and that they often spend an evening together. I gave him a comprehensive idea of what submarine information was desired. He said he was not sure but thought he could get some of it and would try particularly to learn the numbers and types and get a picture of the one tied up astern of him and forward same to me.

Upon leaving, we walked by the big submarine and by pacing off we measured it to be 255 feet. The ship's officer said the foreman told him that the submarine we had just measured was the same type as two others that were building there. I then started leaving the yard accompanied by the officer to give the impression that my visit was in connection with his repairs. We saw one large submarine in the floating dry dock about ready to come out and one on the ways; probably to be launched in two months. There was one building ways empty and another on which a steel merchant ship was being built and which I was told will be used for naval training purposes. I believe the three submarines at Mitsubishi are the same type and that the two launched are *Nos. 72* and *73* and that the one on the ways is *No. 74*.

Several days later the ship's officer stated that it was not so easy to obtain the information as he had thought. At present writing he is still on the trail for information and for pictures. Since guards are stationed around the submarines he will have difficulty getting pic-

NAGATO AT ANCHOR.

tures and I am not optimistic about the prospects. The information he obtained is as follows:

(*a*) Mitsubishi is building three boats of about 1,500 tons surface displacement.

(*b*) All the above are British type.

(*c*) Mitsubishi will probably build three more of the above type.

(*d*) On November 22, 1923, one of the Mitsubishi submarines, *No. 72*, made engine runs of 16 knots, and on November 24 she made a surface run of 20 knots. She has not yet submerged

(*e*) The boats building at Kawasaki are the Italian type, and if they are successful two more will be built there.

My informant said the above was given him by the submarine foreman and is reliable.

My inspection of the boat I got close aboard of showed the following:

(*a*) Length 255 feet from stem to stern; 132 feet from conning tower to bow.

(*b*) Extreme breadth, approximately 20 feet.

(*c*) Six bow tubes.

(*d*) Large chariot bridge and two tapered conning tower periscopes.

(*e*) Plates forward for oscillator signal device.

(*f*) Large underwater body.

While passing Kawasaki at some distance in a steam launch, I saw three submarines in the water. One of them seemed larger than the others, but it may have been lighter and just higher out of the water. I know one of them is the *No. 70*, which I feel certain is about 1,500 tons submerged displacement.

Later a closer view was obtained from a sampan, and our belief is that the three boats are the *No. 70*, her sister ship the *No. 71*, and another smaller boat of about 750 tons surface displacement, which I believe is *No. 69*.

Nothing could be learned regarding the cause of the sinking of *No. 70*, but it was intimated that quite a number of expert submarine mechanics from Kawasaki yard were lost.

FRANCE.

NAVAL MANEUVERS.

December, 1923.

Motive: Blockade of French port by submarines as a test of locating and destroying submarines by light antisubmarine forces, and as a test of new organization of naval districts.

General situation.—The blue main force under command of Rear Admiral Docteur is based on Cherbourg.

The red force, 12 submarines, is blockading the port of Cherbourg.

The operations are being directed by Vice Admiral Merveilleux du Vegnaux of the conseil superieur of the navy.

The blue force consists of: (*1*) Old battleship *Diderot* (representing a squadron), flagship of Rear Admiral Docteur; (*2*) destroyers (10), operating with battle squadron; (*3*) channel flotilla, composed of dispatch boats, old torpedo boats, chasers, etc.; (*4*) air force, composed of four squadrons of planes and one dirigible; (*5*) land force, lookout and radio stations in the district.

The red force consists of: (*1*) Submarine force, 12 submarines based on Brest.

Special situation.—The blue main force attempts to leave and to return to the harbor of Cherbourg under different visibility conditions and escape the red blockading submarines. The problem is designed to test the efficient cooperation of the various units.

NOTE.—Owing to lack of available funds for fuel, only one major vessel, an old battleship, was used in these maneuvers. The coast defense vessels, torpedo boats, sweepers, chasers, etc., were operated with reduced personnel owing to the fact that the French Navy is short-handed.

The commanders of the two forces were the commandants of the naval districts of the channel and of the Atlantic. The red commander, Vice Admiral Schwerer, remained at his headquarters at L'Orient and directed the blockading submarines from that station. The blue commander, Vice Admiral Barthes, directed the surface forces and aircraft of the defense from on board the destroyer *Sakalave*.

This was the first test of the functioning of the new organization of the coast defense now wholly under the navy.

ITALY.

A REPORT ON THE MACCHI AND SAVOIA AVIATION PLANTS.

December, 1923.

A visit was recently made to the plant of the Macchi Aviation Co. at Varese, Italy, and the plant of the Savoia Co. at Sesto Calandre, Italy. Before leaving Rome, letters of introduction were obtained from Major General Guidoni, head of the technical division of the Italian Royal Air Force.

The Macchi plant at the time of the visit was employing 600 men and appeared to have plenty of work on hand. This work consisted of construction of Macchi single engine flying boats, combat type;

Macchi single place land type combat planes, and a very limited amount of experimental construction. In general design most of the work in the Macchi plant appeared to be rather behind the times, but the workmanship was very good. The only thing observed which was considered to be of possible interest to the Navy Department was an experimental two-engined flying boat, designed to carry a 5 meter torpedo. This boat was very nearly completed. It was of a size about halfway between the HS–2 and F5L types. The engines consisted of two 300 horsepower Fiat of 6 cylinders each, and were arranged in tandem similar to the arrangement followed in the French Latham. The general construction followed usual lines with the exception of the modification of the hull to take the torpedo. The boat contained gunner's seat forward, two seats in pilot's cockpit (but only one control wheel) and mechanic gunner's cockpit aft. It appeared to be designed to carry one pilot, one radio operator, one gunner, one mechanic gunner. Down the middle of the bottom of the hull was a recess in the form of an inverted "U," this recess extending from about the water-line position forward to the water-line position aft, and was sufficiently wide and deep to receive a 5 meter torpedo. The torpedo was to be held in position by special devices operated from inside the hull (not yet fitted). There were two metal shutters on rollers inside the hull, one forward and one aft. These shutters were arranged so that by revolving a crank each shutter would be pulled out through an opening in the hull, and down along the bottom of the hull in such a way as to completely inclose the space containing the torpedo. Water-tightness was secured by the hull structure itself, the shutters being merely overlapping metal strips similar to window blinds. The ends of each strip, as they came outside the hull, passed along in grooves which held them in place and gave them sufficient rigidity to stand the pressure of planing action. The proposed method of use of the torpedo plane was to attach the torpedo while seaplane was on shore, then operate the shutters to give the bottom of the hull a more or less smooth surface for planing, and after taking off to pull the shutters back into the hull again in order that the torpedo could be dropped.

The plane is obviously designed for operations from a shore base. The manufacturers stated that they hoped to obtain a speed of 96 miles an hour, and that they were providing tanks to give four hours fuel capacity with the torpedo on board.

The Savoia plant is located at Sesto Calandre. It is considerably larger than the Macchi, and at the time of inspection was employing 700 men, who were principally engaged in building Savoia type flying boats, Savoia single-seater combat land planes, and Savoia two-seater reconnaissance planes. The same remarks as applied to the

Macchi plant apply here, namely, that the designs appeared rather out of date but the workmanship was very good. The interesting experimental work at the Savoia plant was the construction of a two-engined twin boat torpedo plane. The construction had not progressed beyond the completion of the wings. The interesting features were:

(*a*) The use of twin boats.

(*b*) The fact that the design calls for constructing each of these boats in two halves, the top half to be integral with the engine section of the plane.

(*c*) The tandem arrangement of the engines on the top wing.

(*d*) The spar type of tail.

The wing construction appeared to be good. Three-ply wood was used for surface covering.

Examination of the plans indicates a rather peculiar form of plane, such as effort having apparently been made to offset the high thrust of the engine by a big dihedral, very large chord with respect to length of tail, and possibly inadequate bracing of hulls against tendency to roll.

The general attitude at both the Macchi and Savoia factories was one of satisfaction with the amount of orders on hand, and the prospects of future business on account of the proposed expansion of the Italian air service. The impression was created that considerably more attention was being given to the construction of water type planes than of land planes. There is no denying, however, that in spite of the considerable amount of business the two plants above described are doing, very little improvement has been made in the past several years in design. One handicap to Italian design seems to be the fact that the only Italian engine of any considerable horsepower which is regarded as entirely reliable is the 300 horsepower Fiat, and this engine does not lend itself to clean design of planes.

ITALY.

CANDIDATES FOR NEW AIR FORCE.

December, 1923.

An interesting development of the new academy for aeronautics is reported in the Italian press as follows:

The examinations for candidates for entrance set for October 15 have been postponed until the 30th and may be further postponed or waived entirely for candidates for the first class of students in the new academy. Candidates have been notified to send in their school certificates and other necessary papers without delay to the commissariato for consideration.

It seems that there have been very few applicants, which has been a great surprise and blow to the heads of the new Royal Flying Corps; the reason seems to be that the young men of Italy refuse to enter the Flying Corps as a life profession. They are willing to adopt flying for the younger years of their lives but not as a life career.

ITALY.

NEW DESIGN OF SUBMARINE.

December, 1923.

The following information has been obtained relative to the new De Feo design of submarine:

Vincenzo De Feo is a captain in the line of the Italian Navy. He is at present on duty in the ministry of marine and is director general of arms and armament (corresponds to our Chief of Bureau of Ordnance). He has had a great deal of experience with Italian submarines, and he commanded the first successful submarine built in Italy. Ever since that time he has devoted a great deal of thought and study to the subject.

Captain De Feo is not a naval constructor, and it appears that in the designs of his submarine he may meet with opposition from the naval constructors.

He claims no very radical departures from the best of present submarines, as far as the major details are concerned, but has merely rearranged the disposition of various weights and location of machinery, etc., in which he claims a saving in weight of about 20 per cent. This saving in weight Captain De Feo has utilized in—

(1) A larger armament in guns and torpedo tubes.

(2) Increased stability.

(3) Increased speed (about 1 knot).

(4) Vastly increased manageability.

Plans are completed for the De Feo type of submarine and are drawn up for a submarine of about 1,000 tons surface displacement; a speed of about 19 knots, with about 10 knots submerged speed; a reserve speed of about 12 knots for half an hour submerged is contemplated to permit the submarine to quickly escape after firing her torpedoes and get outside of the depth bomb barrage area.

The completed plans for the De Feo submarine were made at the Fiat San Giorgio Works at Spezia; such plans are now complete in all details ready for the laying down of the boats in case the Italian ministry of marine should decide to build this type. It appears that the ministry of marine is seriously considering this type at the present moment.

There are two schools of submarine builders in Italy. One advocating the heavy center and light end construction, and the other the heavy ends and light center construction.

The De Feo design is of the type with heavy center and light ends, which he claims gives increased stability, in fact a constant stability for all depths, which he claims is very important for crash diving, etc.

Besides the features of saving in weight which has been put into increased armament and speed and stability, the only other novelty in this design is in the arrangement of the various parts of the submarine; that is, Captain De Feo has made a special study of the managibility of the submarine from the commanding officer's point of view as well as from the seagoing point of view of the man who handles the submarine rather than the naval constructor who designs it.

In the new design the machinery of the submarine is grouped about the captain's central station in order that he may have every important element under his own eye, similar to the driving seat of an automobile or motor boat.

The submarine's heavy oil engines are just forward of the captain's central station and completely under his control thereby.

All of the torpedo firing gear is also directly under his eye and control.

ITALY.

STRENGTH OF THE AIR SERVICE.

December, 1923.

ORGANIZATION AND AIRPLANE STRENGTH OF THE ITALIAN AIR SERVICE.

On November 3, 1923, the Italian Military Air Service consisted of 5,000 enlisted men. Of this total 250 are pilots and 300 are under instruction to become pilots.

The total number of officers is 560, 300 of whom are flying officers (temporary and transferred) under instruction to become pilots and observers with the view of joining permanently the air service.

The number of machines now in use by the Italian Military Air Service is as follows:

Pursuit	230
Observation	300
Bombardment	110
Total	640

At the present time there are 431 usable military type planes in reserve as follows:

Pursuit	220
Observation	135
Bombardment	76
Total	431

During the present calandar year to October 31, the following new machines have been put out by the Italian aircraft manufacturers:

Pursuit	81
Observation	133
Bombardment	67
Others	15
Total	296

During the same period the following number of machines have been made over (not counting repairs) by these establishments:

Pursuit	150
Observation	90
Bombardment	59
School	104
Total	403

At present the number of military machines actually in process of manufacture is 125.

In addition to four dirigibles the semirigid dirigible "N" of 660,000 cubic feet is under construction for the military air service and is 85 per cent completed.

The commissariat of aviation, which controls all air activities in Italy, is concentrating all its efforts toward carrying out the Government's military aviation program, which calls for 66 squadrons and 1,600 machines in efficient shape by June 30, 1924. When this program was initiated 8 months ago there were 30 squadrons (army and navy), but considerable money and time were necessary to bring them up to full strength in flying equipment and personnel. It is believed that the commissariat of aviation will be unable to complete its program before the end of 1924.

In connection with this organization the following should be noted:

(*a*) Preliminary and advanced flying instruction are given by several civil aerial companies under contract with the Government. Students are then sent for service to the depot squadrons prior to joining the squadrons of their specialty.

(*b*) An aviation academy is being organized which will eventually furnish all officer personnel. At the present time the school, consisting of not more than 60 students for this year, is being carried in connection with the Naval Academy at Livorno (Leghorn). The course is three years.

(*c*) A distinct uniform for the air service has been adopted and is now being worn by officers and enlisted men.

(*d*) The engineering and construction division has its own officers commissioned therein and not available for duty with other divisions of the air service. There are about 60 of these officers at present.

(*e*) The commissario of aviation is at present the Prime Minister, the vice commissario is an undersecretary of state, the commanding general of the military air service is a lieutenant general, the director general of the civil air service (a civilian) has been given the rank of intendant general with the relative rank of lieutenant general, the officer in charge of aeronautical engineering and construction is a major general.

The lighter-than-air constructing establishment has initiated the construction of a very small semirigid dirigible for experimental purposes. Its maximum length is 25 meters.

At the present time there are four dirigibles in efficient service organized into a dirigible group. They are:

	Cubic feet.
The Esperia (formerly the Bodensee), rigid	796,240
The F–6 (semirigid)	670,000
The PM (semirigid)	186,083
The OS (semirigid)	175,490

Number and capacity of dirigibles built in Italy since 1908.

Year.	Number of dirigibles built.	Approximate aggregate capacity.	
		Cubic meters.	Cubic feet.
1908	1	5,000	176,500
1909	1	5,000	176,000
1910	3	8,000	282,500
1911	2	16,000	565,000
1912	1	14,000	494,250
1913	3	18,000	635,500
1914			
1915	3	18,000	635,500
1916	9	108,000	3,813,500
1917	11	92,000	3,248,500
1918	19	158,000	5,579,000
1919	5	50,000	1,765,500
1920	2	40,000	1,412,500
1921	3	20,000	706,250
1922	4	14,000	494,250
Total	67	566,000	19,985,250

Since March the following number of aviation engines in storage have been overhauled and put in efficient service:

March	41
April	56
May	40
June	88
July	185
August	256
September	259
October	260
Total	1,185

On October 31 a large demonstration over Rome was made by the Italian Government to show what had been accomplished to date in carrying out the Government's program in building up a strong military air force.

Two hundred and fifty machines and four dirigibles were kept in the air over Rome for about one and a half hours. Fifty machines were held in reserve on the ground. During the night a simulated night attack on the city was carried out.

One machine only was forced out of its formation due to engine trouble.

This aerial concentration demonstrated that during the last few months the Italian military air force has been greatly strengthened in flying material and personnel and that its general efficiency has been greatly improved.

In two public speeches, Mr. Mussolini, the Prime Minister, restated his policy that Italy must maintain a strong and efficient military air service; that as a man he might follow dreams and illusions, but as head of the Government with enormous responsibilities he had no faith in universal peace and still less in perpetual peace. He stated that other nations are arming in the air and his Government is obligated to a strong aviation policy; that next year the number of machines over Rome would be three times as great, but that Italy's geographic location shows that Italy will never have a sufficient number of airplanes to defend herself.

Moneys appropriated for Italian aeronautical service are as follows:

The Government is spending during the current fiscal year on its civil and military aviation an established and approved sum of 300,000,000 lire. The office of the commissariat states that before the end of the fiscal year an additional sum of 200,000,000 lire may be spent if needed to execute the aviation program.

The 300,000,000 lire is being spent almost entirely on building up a powerful military air force. The commissariat of aviation is con-

centrating all its efforts toward carrying out the Government's military program, which calls for 66 squadrons.

For some months attempt has been made to obtain detailed data on the apportionment of this sum but without success.

The amount was allowed in a lump sum put at the disposal of the commissariat of aviations, which controls all Government aviation activities.

The commissariat reports that 75,000,000 lire (25 per cent) are being expended on pay and flying pay of personnel and 185,000,000 lire (62 per cent) in obtaining new material.

Of the 75,000,000 expended on pay, 85 per cent is expended on the military personnel of organizations and offices under the general headquarters of the military air service, and 15 per cent on the personnel coming under the director general of civil air service including the military personnel of the engineering and constructing division, which has its own officers commissioned therein.

At the present time the total sum being considered for aviation for the next fiscal year is 500,000,000 lire, but the definite decision of the Government in the matter has not been made.

CHINA.

RÉSUMÉ OF POLITICAL SITUATION SINCE SEPTEMBER.

December, 1923.

The election of a new President by the Parliament sitting in Peking has brought about no noteworthy change in the condition of China so far as it affects the peace of the land and trade and industry which are so much dependent upon peace in the interior. While there seems to be no prospect at this moment of civil war on a large scale, there is also no more hope than ever that Peking can evolve an efficient government supported and respected by all Provinces and all factions. The opposition to the administration now ensconced is torn by so many differences of opinion that a big coalition to oust President Tsao Kun and his following appears to be out of the question. At the same time President Tsao has shown less promise of doing anything constructive since his election than he did as a provincial military governor, while his followers are showing more and more disposition daily to squabble over the right to exploit the military prestige which he still enjoys.

Marshal Tsao Kun, military governor of Chihli and military inspector general of the Provinces of Chihli, Honan, and Shantung, was elected President in Parliament October 5, 1923, by 480 votes out of a total ballot of 592.

A month before the election it seemed absolutely certain that Tsao Kun could not be elected. The fashion in which Tsao's followers had hounded President Li Yuan-hung out of the capital aroused great popular feeling; not because Li himself was much liked or respected but because the affair was looked upon as a national disgrace. A number of the members of Parliament went to Shanghai, while several hundred went south by invitation of the Anfu and Kuomintang parties and prepared to set up a rival government. For many weeks it was impossible to get a quorum in Parliament either for ordinary business or for the constitution drafting sessions. Money was spent lavishly on both sides, but Tsao Kun's followers failed to buy a quorum and the opposition, in September, seemed to be consolidating. Several of the Tsao Kun followers—notably Wu Ching-lien, speaker of the Lower House, and Hsiung Ping-chi, civil governor of Shantung, went ahead doggedly with preparations for an election The time came, near the end of September, when the situation was obviously a stalemate. The Tsao Kun followers could not get a quorum in Peking and the opposition, in spite of large expenditures of money, could not buy a quorum elsewhere.

This was broken by the opposition parties, who suddenly threw up the sponge and announced that the easiest way to ruin Tsao Kun, after all, was to have him elected President. The opposition members of Parliament returned to Peking in droves. The constitution was promptly completed and prepared for promulgation and most elaborate arrangements were made for the election, the principal care being to raise a sufficiently large fund to reward the members of Parliament handsomely. When the time for the election came, group leaders were paid $10,000 each and ordinary members $5,000. The actual expenditure in bribes was about $1,400,000 while all the expenses of the election, including preliminary bribes, are said to have reached $5,000,000. Of this Tsao Kun, who is enormously rich, is believed to have spent nothing. What money was not taken from public funds was contributed by the provincial military chiefs who acknowledge allegiance to Tsao Kun and by big commercial organizations such as the Chihli Salt Merchants' Guild, which is said to have been taxed something like $200,000.

The man who was thus railroaded into the Presidency is an illiterate scion of the coolie class who began life as a cloth peddler. He entered the army as a private about 1894, when Yuan Shih-kai was just forming the modern organization, and received his first minor promotions because of his tremendous voice, through the exercise of which he qualified as a corporal and later as a drill master. In the army he was always known as a slow-witted fellow who never presumed to have an original thought, but he was always liked. He

distingnished himself as a man without a personal enemy and has always been known for his good nature and generosity. His whole strength as a military chief still rests upon the personal attachment of a number of high officers who were once his colleagues and subordinates.

In the early days of the modern Chinese Army, Yuan Shih-kai had three capable assistants—Tuan Chi-jui, Feng Kuo-chang, and Wang Shihchen. The last named has taken very little part in active politics since Yuan Shih-kai's death in 1916. Tuan and Feng were, however, active rivals up to the time of the latter's death in 1918. Tsao Kun was brought up in the world by Feng Kuo-chang, whom he followed with a dog-like devotion. While both Tuan and Feng were active in Republican politics, the Feng Kuo-chang following came to be known as the Chihli Party, because Feng was a native of Chihli Province, to distinguish it from the Anhwei Party, so called because Tuan Chi-jui was a native of Anhwei. Feng Kuo-chang's Chihli Party is the organization which Tsao Kun inherited and which put him into office. In 1917 Tsao Kun, as commander of the third division, then in Paotingfu, assisted Tuan Chi-jui to overthrow the restored monarchy in Peking. Immediately after this event Feng Kuo-chang succeeded to the Presidency and established Tsao Kun firmly in Paotingfu (capital of the metropolitan Province) as civil governor. When the third division had to be sent into Hunan to put down a rebellion, Feng retained Tsao in Paotingfu and sent Wu Pei-fu as acting division commander. After Feng Kuo-chang's death, Tuan Chi-jui became sole and supreme dictator in the northern military organization; Tsao Kun, though still tuchun of Chihli, enjoyed little power and his subordinate Wu Pei-fu, then in south Hunan, was wholly ignored, receiving neither supplies nor money for the third division. The Chihli Party was then at low ebb and the Anhwei Party ruled North China, became known as the Anfu Party, worked closely with Japanese military agents, and consistently defied public opinion by making numerous loans and contracts favorable to the Japanese.

Partly as a protest against his ill usage at the hands of Peking, and partly as a protest against the pro-Japanese activities of the Anfu Party, Wu Pei-fu accepted money from Dr. Wu Ting-fang in the spring of 1920 and started back toward Peking with the avowed intention of driving Tuan Chi-jui and the Anfuites out of Peking. Tsao Kun was badly frightened and attempted to prevent a fight, but Wu Pei-fu insisted and a few weeks later inflicted an overwhelming defeat upon Tuan Chi-jui, whereupon Tsao Kun—still Wu's immediate military chief and his friend—was elevated to control of all the northern forces except the Manchurian armies under Chang Tso-lin, which had supported Wu Pei-fu. In 1921,

Wu Pei-fu extended Tsao's influence by suppressing Hunanese and Szechuanese rebellions; and, in 1922, he won Tsao the supreme military position in north China by defeating Chang Tso-lin, who had assumed control of the Peking Government.

Wu Pei-fu has always shown a strong disinclination to assume responsibility in an administrative position. He has a phrase which he has worn threadbare to the effect that he creates opportunities for reform of which the people must take advantage if they want reform. But after his victory over Chang Tso-lin in 1922 he took it upon himself to bring Li Yuan-hung back into the Presidency and to recall the old Parliament, dispersed in 1917 before its term had expired; after which he retired to Loyang, in Honan, and professed to have finished his job.

The government which Wu Pei-fu had established started well and showed some promise. It was at this juncture that the campaign, initiated by Tsao Jui (a younger brother of Tsao Kun), was opened to push Tsao Kun into the Presidency. This campaign has been pushed unscrupulously by all wings of the Chihli Party, except Wu Pei-fu's immediate command. Since then the activities of the little group around Tsao Jui, now generally known as the Tientsin clique, have been particularly scandalous. Tsao Jui, jealous for his brother's supremacy in the party, conspired with Wu Ching-lien and other leaders to overthrow the Wu Government and, through the most unscrupulous methods, contrived to accomplish this feat—December, 1922—after which all energies were bent upon getting Li Yuan-hung out of office and upon bringing Tsao Kun in.

Tsao Kun is supported by several political groups which have little in common with one another. The most active of these is the Tientsin clique. Another is the Cheng Hsueh Hui (now called the Hsien Cheng Hui), which is a group of renegades from the old Kuomintang made up mostly of ex-officials from Kwangtung and Kwangsi. Still another group of ex-officials formerly associated with the Anfu Party, led by Pau Fu, Chang Chih-tan, ex-Premier Chin Yun-peng, and others, took an active part in forcing through the election. Finally there is the so-called Christian Party, composed for the most part of foreign educated men trained in diplomacy, with General Feng Yu-hsiang as their military mainstay.

The opposition in one sense comprises the majority of the population of China, but there are actually no more than three big groups, namely, the Anfu Party, the Fengtien Party, and the Kuomintang Party. The first is led by Marshal Tuan Chi-jui, now living in retirement in Tientsin; the second by Marshal Chang Tso-lin, the acknowledged ruler of Manchuria; and the third by Sun Yat-sen who is at present fighting to maintain a weakening grip upon Kwangtung Province. Throughout the country there are, of course, hun-

dreds of influential military men and politicians of mixed or doubtful allegiance, who are more or less on the fence and whose position it is impossible to define. A list of these with their various affiliations would be more confusing than illuminating.

The summary eviction of Li Yuan-hung from the capital, the bribery and corruption in Parliament, and all the other irregularities which led up to the election were condoned in many minds, both foreign and Chinese, because of the widely expressed hope that Tsao Kun, with all his military prestige, "would do something." The most marked aftereffect of the election was a decided political lull. This was due in part to the fact that many hoped that Tsao would use his power to better general conditions in China. The members of the diplomatic body, while recognizing that Tsao was not a man of much ability and that his election was a very sordid burlesque, were pleased to recognize him because they wanted some one with real power upon whom they could bring pressure to execute mandates in the Province. The people of China are thoroughly sick of political feuds as well as of civil war and it was generally recognized everywhere that if Tsao Kun put an end to interprovincial warfare, suppressed bandits and restored order, giving trade and industry a breathing spell, political conspiracy against him would be most unpopular. Finally Tsao Kun's election was in large part made possible through the deliberate withdrawal of Anfu, Fengtien, and Kuomintang opposition. These factions apparently made up their minds that they could not eliminate Tsao from politics until he was in the Presidency and he would then quickly enough eliminate himself.

The effect of the election upon the general peace of the country has been nil. The same civil wars which Tsao Kun's all-powerful subordinate Wu Pei-fu was prosecuting before the election in Szechuan, Kwangtung, Fukien, and elsewhere continue without cessation and without marked results other than the absorption of all revenue and the ruin of trade in these unfortunate districts.

While Wu Pei-fu retains all the best northern units as political assets in Honan, Hupeh, Chihli, Shantung, Kiangsu, and Shensi, he continues to recruit great hordes of riffraff in the northern Provinces—including many bandits who believe that they can loot more easily in uniform than in plain clothes—and to ship them off to Szechuan, via the Yangtze River, and to the borders of Kwangtung by way of the Province of Kiangsi. The military commanders engaged in these campaigns, ostensibly designed to reunite China by force of arms under Tsao Kun, have won no decisive victory in any quarter during the past year but have made life miserable for the common people over huge areas, have promoted opium traffic every-

where in their own interest, have used up enormous quantities of ammunition manufactured in the Hanyang and Techow Arsenals running at full capacity, and have exhausted the revenues of Honan and Hupeh and of the Kin-Han Railway, not to mention exactions imposed upon the merchants in Hankow and other cities in central China.

Instead of being able to collect revenues, Tsao Kun, like his predecessors, has been fairly bombarded with demands from the provincial chiefs for money to keep up their armies. The Province of Hupeh alone has volunteered to remit revenues, it having been announced in the papers that something like $200,000 a month would be sent to the capital. This, however, is nothing more than propaganda designed for the foreigner. The remittances, it is clearly understood, will be paper transactions only, made upon the understanding that Peking will promptly turn them back for the upkeep of Wu Pei-Fu's armies in Hupeh and Honan and for the maintenance of his expedition into Szechuan.

All observers, in and out of office, are beginning to be painfully aware that Tsao Kun is not going to do anything which will improve general conditions in China. No one expected him to evolve a program on his own account or to initiate any reforms, but it was expected that he would have sagacity enough to surround himself with capable men who could create a government which all China would eventually be forced to recognize because of its efficiency. In this respect he has been most disappointing and many little groups within his following are already saying that his government is a sinking ship.

The most conspicuous example of Tsao Kun's weakness since his assumption of office has been his complete failure to form a government during the two months that he has been in office. It was thought before he came to Peking that the cabinet was ready made in Paotingfu and that the new President would no sooner be installed than the powers represented in Peking would have a full-fledged and responsible government to deal with.

While it is impossible to suggest a plan for bringing order out of confusion against which insuperable objections could not be brought, there is a complacent feeling throughout the land that things will work themselves out somehow. This year which is coming to a close was the end of what the Chinese call a 60-year cycle, during which they expected no end of trouble. Naturally they got it. They have made up their minds that with the opening of the next cycle all this nonsense will stop and conditions will improve rapidly; and it is very possible that once the whole nation has set its mind upon improvement, there will really be a change. And this is all that can be

said for the outlook. Existing conditions indicate no improvement, but everyone is full of hope. Mr. Sun Hung-yi, a former cabinet minister who lives in Shanghai and has for many years been a stormy petrel, participating in every trouble-making enterprise in China and constantly stirring the pot, recently made the flat statement that within two years China would be at peace and on her feet. How this is to come about he confesses he has not the slightest idea; but this conviction which is so widely prevalent may father a determination which will force improvement and reforms.

CANADA.

ESTIMATE OF THE STRATEGICAL SITUATION OF CANADA AND NEWFOUNDLAND.

October, 1923.

[Prepared by a committee at the Army War College.]

1. Military Aspects of the Geographical Situation of Canada and Its Physical Geography.

1. *Geographical situation.* — Canada, the largest self-governing dominion of the British Empire, with an area of nearly 4,000,000 square miles, includes all of North America, north of the United States except Alaska, Newfoundland, and Labrador. On her east is Labrador and the Atlantic with four ocean seaports and a deep sea waterway to the interior. To the south are the United States and the Great Lakes and on the west are Alaska and the Pacific Ocean with three ocean seaports.

2. *Physical features.*—Canada is divided into the five following distinct regions:

(*a*) The Appalachian region, including southeastern Quebec, New Brunswick, Nova Scotia, and Prince Edward Island.

(*b*) The St. Lawrence lowlands includes that portion of Canada between the Appalachian region on the east and the watershed between the valley of the St. Lawrence and the east shore of Hudson Bay on the west.

(*c*) The Laurentian Plateau includes the greater part of northern Canada and extends from the St. Lawrence lowlands on the east to the line of Lake of the Woods, Lakes Winnipeg, Athabaska, Great Slave and Great Bear, north to the Arctic Ocean. A comparatively small part of this region has been explored.

(*d*) The western plains include the country from the Laurentian Plateau west of the Rocky Mountain region. It extends as far north as the Arctic and contains the granary of Canada.

(*e*) The Rocky Mountain region includes all of Canada west of the Great Plains, being nearly all of British Columbia, Yukon, and a small part of the Northwest Territory.

3. *Military aspects of the geographical situation and the physical features.*—Canada, excepting her connection with the United States, is a very much isolated country. Nature and the fates, in leaving her only the narrow neck between New Brunswick and lower Quebec which is practicable for communications with the sea and only three practicable seaports on the Pacific with mountains barring the rest of the coast and mountain passes commanding the lines from those three ports, have provided natural barriers behind which Canada, with possible effort, could defy the world, so long as she remained friendly with the United States. Against the United States only has nature left her helpless.

4. *Climate.*—Both climate and seasons of the different parts of inhabited Canada are practically the same as those of corresponding sections of the United States immediately over the border. Generally, the winters are long and cold and the summers short, without oppressive heat. Health conditions are generally good.

5. *The inhabited belt.*—This is a narrow strip of territory from 100 to 300 miles wide, extending along the United States border, from Atlantic to Pacific, which contains practically all of Canada's 9,000,000 people, her manufactures, agricultural areas, and most of her greatest mining sections, together with nearly all of her means of communications.

6. *Vital areas.*—These are six in number and are all practically within the inhabited belt, viz:

(*a*) The Provinces of Nova Scotia and New Brunswick, adjacent islands and waters with the seaports of Halifax, Nova Scotia, and St. Johns, New Brunswick, as sensitive points.

(*b*) The southeast corner of the Province of Quebec, including Montreal and city of Quebec as sensitive points.

(c) The Ontario Peninsula with the cities of Toronto, Hamilton, Windsor, Niagara Falls, and Sarnia as sensitive points.

(*d*) Sault Ste. Marie, Sudbury, the railroad and motor road connecting them and the waters of north channel with the canals at "The Soo" and the nickel mines at Sudbury as sensitive points.

(*e*) The area south from Lake Winnipeg, including both banks of the Red River to the United States border with the city of Winnipeg as its sensitive point.

(*f*) The southwestern corner of British Columbia, including the southern end of Vancouver Island with the seaports of Vancouver, Victoria, Esquimault and intervening waters as sensitive points.

7. *Conclusions.*—First. That in a Canadian combination against the United States, the United States' objectives logically are as follows:

(*a*) Areas one and six are of first importance and should be seized before help could arrive from overseas allies.

(*b*) Failing one and six then two and five become of next importance and both should be seized and held.

(*c*) Next in importance and vitally so, should enemies hold one, two, five, and six, are three and four.

(*d*) United States successes on one coast with failures on the other would bring about other combinations of these important areas from a study of which it is seen that the outer areas or those nearest the two coasts will generally be of first importance.

Second. That in the same combination against the United States those six areas are still the vital sections of that combination, viz:

(*a*) One and six are necessary to get into Canada and to avail themselves of her resources. Six is a probable base for operations against the United States' Pacific coast.

(*b*) Two and three are possible and natural bases of operations against the United States, aimed at vital United States areas.

(*c*) Four is essential for the command of waterways at the "Soo" and the nickel and copper mines at Sudbury.

(*d*) Five is necessary for the control of transcontinental communications, for securing the resources of the Great Plains and for possible assistance from the Pacific.

Third. (*a*) That in spite of a sentiment of long standing for the mother country and the assistance she rendered England in the World War, as well as any existing international understandings which may exist, it is believed that Canada is a natural and logical ally of the United States.

(*b*) That because of Canada's geographical situations with respect to her transoceanic allies and the United States, it is believed that her foreign policy would be never to engage in any conflict which might require her to become an active enemy of the United States.

(*c*) That with such a foreign policy she shall in the future, as at the present, require a very small army and navy and these present conditions in armaments would seem to prove the correctness of this policy as deduced.

II. Political Situation.

A. *Internal conditions.*—1. The right of self-government and federation in Canada was given to the Provinces by the British Parliament. The titular head of the Dominion Government is a Governor General, who represents the Imperial Government in Canada. This outside influence is an element which does not exist

in the Government of the United States. With us the sovereign States endowed the Federal Government of the United States with such powers as it possesses. The Dominion is practically independent, having her own Parliament and all the other agencies for home government.

2. The racial characteristics are more marked in Canada than in the United States, and the population, with plenty of space for development, is a hardy, self-reliant race, easily trained into the highest type of soldier. There is but a very slight mixture of Latin blood and a determined effort is being made to check Asiatic immigration. The aboriginal population has been humanely handled by the Canadian Government and is on the increase, with no detriment to the State. The original French "inhabitants" form a distinct racial group which Great Britain has handled with consummate diplomacy, so that they are the center of resistance to American annexation or absorption. The various creeds still have a strong hold in Canada and their influence is felt politically.

3. Her internal conditions, customs, business methods, habits of political and religious thought are very similar to those of the people of the United States, and a constant fusion of population is going on. A preponderance of American investments in Canada and increased transportation facilities across the border, and other similar causes, are bringing into closer union the two countries.

B. *Foreign relation.*—1. In the past the Canadian Government has only had foreign relations through the Imperial Government. Recently, however, it has been treating directly with the United States on matters of mutual interest, and has been consulted by the home government on other matters of foreign interest. Her status as to foreign affairs is now under discussion in the Imperial Conference.

2. It has been suggested, in case of hostilities between the United States and Great Britain, that Canada, which contains the largest English-speaking population of any of the British colonies, would remain neutral. One of the many questions which might be raised against such a proposed neutrality is the handling of the cable systems to Canada, the west Indies, and the Orient.

Conclusions.—1. By great leniency and diplomacy Great Britain has maintained a strong sentiment of loyalty in Canada.

2. While there are no causes for friction or hostilities between the United States and Canada sufficient to bring about a war, yet, as in the past, it is possible that a state of war might be brought on by trouble between this Government and Great Britain, allied with other European or Asiatic powers. In this case Canada, while not a menace in herself, might become a dangerous weapon in the hands of Great Britain.

3. It would seem impossible, in case of a war with Great Britain, that we could allow Canada to protect her existence as a British colony by a simple declaration of neutrality. Undoubtedly American public opinion, as well as our military security, would require that she declare herself an independent country, at least.

III. Economic Situation.

A. *Food.*—Canada produces a surplus of all essential foodstuffs.

About 66 per cent of Canada's exports are food.

The food products are well distributed throughout the Dominion.

Neither Canada as a whole nor any considerable area could be starved by cutting off outside sources of food.

B. *Industries and munitioning capacity.*—The variety and capacity of Canada's industries are sufficient to supply her ordinary needs.

Due to her war experience, her industries could be converted within a year to supply her war needs, except for artillery.

Her industries are largely dependent on raw materials received from the United States, the more important being iron, coal, and cotton.

Most of Canada's domestic sources of important raw materials and all of her important industrial areas are near the southern border, making them especially vulnerable to attack from the south. The Ontario Peninsula is very important, as it contains about 50 per cent of the manufacturing and 41½ per cent of the munitioning capacity of the Dominion.

C. *Foreign commerce.*—Canada's most important exports are food and forest products.

Her most important imports are mineral and vegetable products, fibers, and textiles.

The countries with which Canada has the most important trade relations in order of importance are: United States, United Kingdom, Japan, France, Cuba, Italy, Belgium, and the Netherlands.

More than 54 per cent of Canada's foreign trade is with the United States. This trade is vital to Canada's industry and commerce.

D. *Finance.*—Canada's financial condition is sound.

Her per capita debt ($275) is only slightly greater than that of the United States ($200).

The public debt is mainly (84 per cent) held in Canada.

Her money is only slightly below par ($0.9875).

Her revenues exceed her ordinary expenditures.

Her credit is good and it is believed that Canada could finance a war requiring her maximum effort.

E. *Communications.*—1. Railroads: Practically all are standard gauge. Three transcontinental systems. Total mileage in operation,

39,384. One mile of siding to 4 miles of main line, adequate rolling stock. In construction, equipment, roadbed, management practically same as for the railroads of the United States.

2. Electric roads: Confined generally to cities and large towns in which the service is sufficient. There are several long lines in Ontario and one 244-mile system in British Columbia.

3. Roads: Approximately 250,000 miles within the Dominion. About 36,500 miles are surfaced with various materials, 10,000 miles of which is classed as first-class roadway. Quebec, Ontario, and British Columbia lead in first-class road mileage.

4. Horses and motor vehicles: Horses in Canada in 1921, 3,814,000. Motor vehicles in 1921, 465,378.

5. Canals, rivers, and lakes: There are five canal systems in Canada, viz:

(*a*) From Fort William and Port Arthur to Montreal by way of the Great Lakes and the St. Lawrence.

(*b*) From Montreal to the United States border near Lake Champlain, via the Richelieu River.

(*c*) From Montreal to Ottawa, via the Ottawa River.

(*d*) From Ottawa to Kingston, via the Rideau River and Lake.

(*e*) From St. Peters Bay to Bras d'Or Lakes, Cape Breton Island, Nova Scotia.

(*f*) The St. Lawrence River is navigable for ocean shipping to Montreal.

6. Shipping: Tonnage registered:

4,008 screw steamers, net tonnage	621,160
273 paddle steamers, net tonnage	55,099
3,347 sailing vessels, net tonnage	206,040
1,276 other craft, net tonnage	269,681
Total	1,151,980

7. Seaports: (*a*) Atlantic coast open the entire year. Halifax, Nova Scotia, 29 to 46 feet of water, 39 wharves.

St. Johns, New Brunswick, 32 feet of water low tide in entrance of channel; 58 to 60 feet of water high tide in entrance of channel: 14 loading berths.

Lesser ports: Louisburg, Cape Breton Island. Sydney, Cape Breton Island.

(*b*) Pacific coast open the entire year.

Vancouver, British Columbia, 31 feet water entrance to central harbor, 18,540 linear feet wharf line.

Victoria, outside breakwater, 1,738 feet wharfage: inside breakwater, 35 feet water low tide, 4,000 feet wharfage.

Prince Rupert, 6 fathoms alongside wharf, 740 feet wharfage.

8. Fuel oil stations in order of normal supply: Eastern Canada—Montreal; Halifax; St. Johns, New Brunswick; Fort William, Sarnia; Quebec. Western Canada—Vancouver, Prince Rupert.

9. Coaling stations: Eastern Canada—Halifax, Nova Scotia; Sydney, Cape Breton Island; St. Johns, New Brunswick; Port Arthur, Ontario; Montreal, Quebec; Quebec City; Owen Sound, Ontario; Port Dalhousie, Ontario. Western Canada—Vancouver, Esquimault.

10. Means of liaison:

Telegraph for January, 1921:	
Pole line mileage	52,393
Wire mileage	238,866
Telegraph offices	4,825
Telephone for January, 1921:	
Wire mileage	2,105,101
Telephones in use	856,266
Persons per 'phone	10.2
Postal for March 31, 1921:	
Post offices in operation	12,252
Rural routes	3,750
Rural route individual boxes	194,790

Cables: Fifteen Atlantic cables land on Nova Scotia. One Pacific cable lands at Vancouver.

Radio:	
East coast (stations)	33
West coast (stations)	19
Government steamers with radio	32

11. Aviation: Airplanes used by the Govenrment for protection of forests and fisheries, for surveying and topography, for the prevention of smuggling, etc.

Licensed air harbors in southern Provinces, 24.

Conclusions.—The systems of communication throughout the Dominion are considered sufficient for any military effort Canada is likely to put forth.

IV. Military Situation.

A. Permanent military, naval, and air establishments, including reserves of finished munitions.

1. *Permanent war establishment and policy.*—(*a*) There are no British troops in Canada.

(*b*) In 1922 the land, naval, and air forces were combined under one Government department headed by a minister of defense, who is responsible to Parliament.

(*c*) The military policy is determined by the Dominion Government, independently of Great Britain, and has but one object—the defense of Canada. The lack of apparent threat of invasion results

in subordination of the defense problem to other national problems such as internal development. There is a strong feeling of autonomy in Canada. The majority of her people believe in supporting the British Empire as a general proposition, but after a crisis has arisen it is the Canadian Parliament which decides if support shall be given and the amount and nature of it.

2. *The land force or militia.*—(*a*) The regular army is known as the permanent active militia. It has an approximate strength of 3,400, of whom only about 2,400 are combatant troops and these are distributed throughout the country in small detachments.

It is organized into 3 regiments of infantry (a total of 9 companies or 1,350 men in 3 regiments); 2 regiments of cavalry (a total of 4 squadrons or 300 men in 2 regiments); 3 batteries of horse artillery (each of 75 men); 5 companies of garrison artillery (each of 60 men); detachments of auxiliary arms and administrative units.

This force instructs the nonpermanent force, supports the civil authorities, and garrisons the forts.

(*b*) The nonpermanent force, active militia, constitutes the country's real organized military force. Its authorized strength is 9,873 officers and 111,734 men. However, its present strength is but 55,000 officers and men.

This force is distributed in 11 military districts, each commanded by a general officer, who has a complete general, technical, and administrative staff. Headquarters of military districts are at (1) London, Ontario, (2) Toronto, (3) Kingston, (4) Montreal, (5) Quebec, (6) Halifax, (7) St. Johns, New Brunswick, (8) and (9) no districts, (10) Winnipeg, (11) Vancouver, (12) Regina, (13) Calgary.

Although no division headquarters have been organized, the smaller units exist in sufficient numbers and of the necessary branches of the service to constitute at least one division in each of the first six military districts. There are in all 125 infantry battalions, 33 cavalry or mounted rifle regiments, 58 batteries of field artillery, 15 batteries of heavy artillery, 15 machine-gun brigades, all more or less completely organized, and in addition to these there are many units of auxiliary arms of the service.

An infantry division usually consists of 3 infantry brigades, of 4 battalions each, 2 or 3 artillery brigades of 4 batteries each, sometimes a cavalry regiment of 3 squadrons, and auxiliary troops. The peace strength of the division is about 10,000 and the war strength may run as high as 18,000.

It is believed that there is on hand in each military district enough modern equipment of the type used in the British Army to equip the militia to its maximum authorized strength. It includes Lee and Endfield rifles; Lewis, Lewis-Savage; Vickers; and Hotchkiss machine guns; and 18-pounder guns.

The nonpermanent force is made up of three-year volunteers. The small units have about one drill a week and approximately three-fifths of the men go to camp for nine days' field training each year. The effectiveness of this force is due to the war training of many of the present personnel, the availability of trained reserves, and the completeness of equipment now on hand.

(*c*) There is an officers' reserve corps of 12,000 officers. Twenty-two schools and colleges have units of a reserve officers' training corps. A military academy, corresponding to West Point, gives a four years' course and has a corps of 160 cadets.

A militia reserve, composed of men discharged from the nonpermanent force, now numbers about 1,000 men.

3. *Permanent naval establishment.*—The navy consists of one light cruiser, two destroyers, two submarines and four mine sweepers. Of these only the two destroyers are in commission and are used in training the naval reserve. One of them is on the Pacific coast at Esquimault and the other at Halifax. There are about 25 officers and 300 men in the active navy. In addition to police and patrol work they train the naval reservists, of whom there are about 500. There are no Canadian naval forces on the Great Lakes, but the Welland Canal will permit destroyers and submarines to be brought into Lake Erie.

4. *Air force.*—The personnel of the Canadian air force is as follows:

Actual strength (permanent forces)	200
Trained reserves (estimated)	1,000
Partially trained reserves (estimated)	2,000
Total authorized reserves	5,000

The equipment consists of about 200 serviceable planes, recently obtained from Great Britain. There are only very limited facilities for the manufacture of aircraft in Canada, and the latter is practically dependent on Great Britain in this respect.

The small permanent force, about 50 officers and 150 men, is employed largely in training flying reserves and, to a limited extent, in forestry patrol and map making.

The principal Canadian training center is at Camp Borden near Toronto, where especially during the winter months reserve personnel is trained. Of the 3,000 reserves, it is estimated that only about 2,000 would be available without several months further training.

Canadians are particularly adapted for aviation; the efficiency of the Canadian fliers during the World War is shown by the fact

that at the end of the war they composed the majority of the personnel of the British air force.

With the reserves of personnel and the equipment on hand, the Canadian air forces could probably place 5 squadrons in the field at once with another 5 squadrons in 30 days.

5. *Fortifications and naval bases.*—Fortifications are known to exist at Halifax, Esquimault, and at Quebec.

Those at Halifax and Esquimault are for harbor defense only Naval bases exist at Halifax and Esquimault. Many ports have large dry docks, the most important being at Montreal.

6. *Fighting efficiency.*—Given time to train, it is equal to the best in the world. Canadians in Europe suffered 50 per cent casualties. An element of great strength in the present force is the comparatively large number of officers, trained in command and higher staff duty.

7. *Reserves of finished munitions.*—(*a*) Ammunition: There was manufactured at the Quebec Arsenal in 1922, 7,000,000 rounds of rifle ammunition and 5,000 rounds of 18-pounder ammunition. At the end of the war, Canada's munition factories were turning out large quantities of all kinds of ammunition, and it is believed that large stocks are now on hand.

(*b*) Small arms: At least 339,000 rifles and over 2,000 machine guns are on hand.

(*c*) Artillery: Sufficient guns and equipment for at least 58 batteries of field artillery and 24 batteries of heavy artillery.

Facilities do not now exist for manufacturing in quantity aircraft or artillery guns and hoyitzers.

B. *Potential man power and probable rate of development in war.*—1. There are now in Canada approximately 4,600,000 males. The class A man power may be taken as 25 per cent of the male population or 1,150,000. About one-sixth of this number are foreign born and not subject to military service. But it is believed that a large number of them would be available in a defensive war. It is believed also that 50 per cent of her class A men could be spared for service in combatant forces. This would make her maximum available man power about 600,000.

2. Should Canada be threatened with an immediate invasion, which would cause her to develop her forces at the maximum rate, it is believed that she could mobilize much more rapidly than she did in 1914, due to the following: Canada now has about 400,000 men who had war training; she has qualified commanders and staffs in each military district; it is believed that mobilization plans and equipment are on hand in each district. Each of the districts numbered from 1

to 6 has in it the nucleus of a division, while in the other districts the organized forces are smaller.

Provided that her mobilization was not interfered with, it is estimated that the Canadian strength in a war closely affecting Canadian interests would be available at not to exceed the following rate: Day, 120,000 (would require considerable effort during period of strained relations), and thereafter at the rate of not more than 50,000 per month for five months. Her maximum effort in the World War at one time was 319,500 in November, 1918.

Conclusions.—1. Canada has an organized military force, not at present powerful, but which in a short time, such as would necessarily elapse during a period of strained relations, could probably take the field completely organized, equipped and 120,000 strong if unopposed during her mobilization.

2. As an ally she would be of great assistance to the United States.

3. As an enemy, Canada would afford a base of operations against the United States and would be a source of great danger. Her first action would probably be defensive and her mobilization and concentration should be interrupted.

NEWFOUNDLAND.

I. Military Aspects of the Geographical Situation of Newfoundland, Including Labrador, and Their Physical Geography.

1. *Geographical situation.*—Newfoundland, a self-governing island of the British Empire with an area of 42,734 square miles, is situated between the Gulf of St. Lawrence and the Atlantic. Labrador, a political part of Newfoundland, is a strip of the mainland between northeastern Quebec and the Atlantic.

2. *Physical features.*—Newfoundland's coast is much indented. Its southeast corner forms the Avalon Peninsula, the important part of the island. Its interior is much broken up by lakes, rivers, marshes, and mountains, one-third of its area being covered with water.

Labrador's coast line is also much indented. Its interior is rough, barren, treeless, and uninhabited.

3. *Military aspects of the geographical situation and physical geography.*—Nature has left Newfoundland at the mercy of the first comer. Further than being used as an auxiliary base it is not believed she would play an important part in any combination of the powers. Labrador is negligible from the military viewpoint.

4. *Climate.*—Newfoundland: Summers not above 70°. Winters seldom below zero. Labrador varies from very cold in the south to arctic temperature in the north.

5. *Vital areas.*—Newfoundland's most important area is the Avalon Peninsula, where most of the population is found. It contains St. Johns, the only city and seaport of importance, the terminus of the only railroad across the island, and the pricipal business and financial center. Immediately north of this peninsula are important iron-ore mines which furnish one-third of Canada's supply from imports.

6. *Conclusions.*—That in a war against the United States Newfoundland would not be a first objective for the United States nor for a combination against the United States, and that in any case its greatest value would lie in its use as an auxiliary base.

II. Political Situation.

A. *Internal conditions.*—1. Newfoundland is the oldest overseas possession of the British Government and possesses and exercises complete independence in home matters, with Labrador as a department. She is governed by her House of Representatives and the Imperial Government is represented by a governor and commander in chief.

2. Of excellent stock, the race is sturdy and self-reliant. Their loyalty to Great Britain is very strong. Religion still has a strong hold and three great creeds divide their affiliations. It is noted that the principal harbors and settlements in Newfoundland are on the eastern coast toward England, and she carries on a very important trade relation with the mother country.

3. While there is great undeveloped mineral and timber wealth, the industry of the country is almost entirely engrossed in the fisheries. Business methods, customs, and ideas, are perhaps more influenced by Great Britain than those of the adjacent mainland. There was considerable migration of loyalists from the United States at the end of the Revolutionary War. There is no great wealth, nor any extreme poverty.

B. *Foreign relations.*—1. Newfoundland's foreign relations are conducted through the Imperial Government.

2. In view of England's probable preponderance on the sea, there seems to be no question of neutrality for Newfoundland. It is to be noted that the distance from St. Johns to Queenstown is only 400 miles greater than the distance to Norfolk, Va.

Conclusions.—In case of a break with Great Britain, this island would afford a possible auxiliary base for a British or allied fleet, and the loyalty of the people to the Imperial Government could be counted upon.

III. Economic Situation.

A. *Food.*—Newfoundland very largely depends for her existence and prosperity on fish and fish products.

Due to climatic reasons, Newfoundland is not a grain-producing country. Except for fish she does not produce her minimum needs for food.

B. *Industries and munitioning capacity.*—Practically the whole commercial life of Newfoundland hinges on cod fish.

Her forest products are a source of revenue.

There are some factories for tobacco, rope, nets, clothing, iron-work, and biscuits, but the plants and raw materials of practically all the above have to be imported.

With the exception of the iron mines at Bell Island. comparatively little is known regarding the mineral wealth of Newfoundland.

These iron mines are important to Canadian industry. Other than this it is not believed that Newfoundland has any munitioning capacity.

C. *Foreign commerce.*—The bulk of Newfoundland's imports are food. The leading items are flour, sugar, and meat.

Her chief exports are fish, forest products, and iron.

Her imports exceed her exports.

Fifty-one per cent of her trade is with Canada, 33 per cent with the United States, 11 per cent with the United Kingdom, and 5 per cent with all other countries.

D. *Finance.*—Newfoundland's financial condition is sound.

Her per capita debt is about $166.

Most of the banking business is done through Canadian banks.

Her expenditures exceed her revenues.

Newfoundland's money is below par; an American dollar is worth about $1.12.

E. *Communications.*—(1) Railroads: One main line, 3-foot 6-inch gauge, extends from Port aux Basques in the southwest corner of the island, north, east, and southeast to St. Johns. Total mileage, 1,100 miles.

(2) Roads: Generally very poor. St. Johns and vicinity have a few good motor roads.

(3) Shipping, January 1, 1921: 3,362 sailing vessels, tonnage 152,166; 137 steam vessels, tonnage 22,018. Lines of steamships connect the coast towns and the island with Canadian mainland.

(4) Seaport and oil-fuel station: St. Johns.

(5) Means of liaison: Telegraph, 4,879 miles; telephone, 899 miles; radio, 15 stations; cable stations at St. Johns and Hearts Content.

Conclusions.—The lines of communications are sufficient for any probable war-time needs.

IV. Military Situation.

A. *Permanent military, naval, and air establishments, including reserves of finished munitions.*—Newfoundland has no military, naval, or air forces. It is not believed that she has any reserves of munitions.

B. *Potential manpower and probable rate of development in war.*—1. Male population is about 134,000. The potential manpower is about 60,000, of whom 20,000 may be considered as the available military manpower.

2. Because of present lack of military forces and unlikelihood of Newfoundland being invaded, it is believed that if Canada and Great Britain were involved in a war in which Canada were threatened with invasion that 10,000 men could be made available for military service in three months and 5,000 more three months later.

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NUMBER 3—1924—MARCH, 1924.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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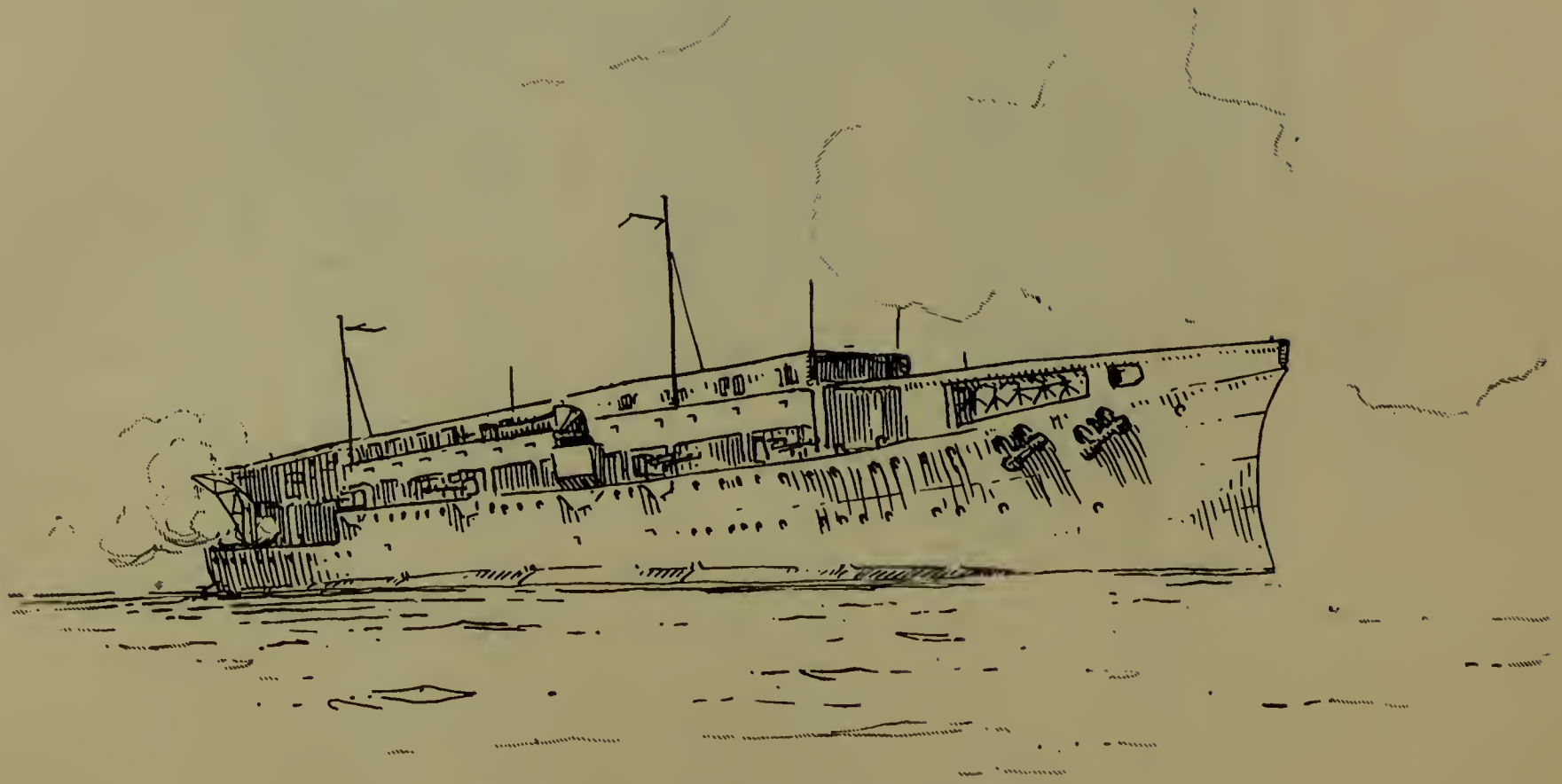

H. M. S. Furious. (Approximate appearance as reconstructed.)

GREAT BRITAIN.

AIRCRAFT CARRIERS.

January, 1924.

The development of the aircraft carrier in Great Britain is still considered somewhat experimental, and it is becoming increasingly evident that opinion as to their general design has not been crystallized as a result of experience. On the contrary, experience with the *Eagle*, *Hermes*, and *Argus* (very dissimilar ships) has tended to develop radically different opinions.

One group considers the large fast carriers without adequate protection (rebuilt *Furious class* and *Saratoga*) as putting faith in vulnerable units which will prove an element of weakness to a fleet. They are alleged to be "easy eggs to crack" for enemy aircraft, destroyers, cruisers, etc. Obviously the underwater protection on such vessels may be excellent, but the vast expanse of unprotected side and decks is pointed out as vulnerable to gunfire from lighter vessels and to bombs from enemy aircraft. The small *Hermes* type is a cheap unit which can be built in large numbers regardless of the treaty. The *Hermes* is reported to carry 20 airplanes (type not stated) on 10,950 tons displacement. The antilarge carrier view is well expressed in the following editorial from the Naval and Military Record of January 9, 1924:

OUR FLOATING AERODROMES.

New details of our latest aircraft carriers, together with illustrations of extraordinary interest, are published in the 1923 edition of Jane's "Fighting Ships." Diagrams show for the first time the exact arrangement of superstructure, guns, boats, etc., the convenient disposal of which is one of the hardest problems confronting the designers of these novel ships. The *Hermes*, we learn, is fitted to carry 20 machines, her displacement being 10,950 tons. The capacity of the *Eagle* is not stated, but as this ship is more than twice as large as the *Hermes* she is, no doubt, capable of transporting a far greater number of aircraft.

Another difficult problem met with in designing these ships is that of stability. The nature of their work calls for a high degree of steadiness under normal conditions of weather, for unless the deck of the ship remains fairly stable no pilot, however well trained, could count on making a safe landing. It is obvious, therefore, that special devices must be fitted in the aircraft carrier to reduce rolling and pitching to a minimum.

Although the *Hermes* is nearly 12,000 tons lighter than the *Eagle*, her flight deck is only 69 feet shorter and 15½ feet narrower than that of the

heavier ship. The difference is important, of course, having regard to the value of every additional square foot of deck room for the purpose in view, but the figures suggest that carriers of relatively modest tonnage can be designed to meet essential requirements. The *Hermes* represents the British Navy's first attempt to build a small carrier, and if she proves a success, as her trials indicate, other vessels of about the same displacement may be ordered.

LARGE CARRIERS OR SMALL?

Japan and the United States have chosen to invest most of the tonnage aggregates allotted to them in a few carriers of very large dimensions, up to 33,000 tons in some cases. The wisdom of this policy is open to question, for the aircraft carrier is at least as vulnerable as the battleship to underwater attack, and far more so to assault by gunfire or bombs.A fleet that possessed two or three gigantic carriers would be in greater danger of having "its eyes put out" than one which had a dozen 10,000-ton carriers, and there is general agreement that future naval actions will be decided largely by air operations. An admiral whose aircraft tenders had been sunk or disabled would fight under a terrible handicap. Through lack of aerial spotting his guns would be ineffective at extreme range; the movements of such enemy ships as were beyond his field of vision would be unknown to him, and his own fleet would be exposed to attack by aerial torpedoes and bombs, a menace that might prove deadly in the absence of protecting aircraft. These truths are so obvious that each side will do its utmost to dispose of the hostile carriers at the very outset of action, and, other things being equal, the fleet which has its aircraft distributed among the greatest number of ships may count on keeping the upper hand in the air. We are well aware of the advantages of great displacement, such as higher speed, increased stowage capacity, and larger flight decks, but are none the less convinced that the soundest policy for this country is to build its future aircraft carriers to the smallest dimensions compatible with efficiency.

Opposed to this is that expressed unofficially by various officers of experience, to the effect that—

(*a*) The *Hermes* is too small and too slow to keep with the fleet at sea. It is contemplated that an aircraft carrier will change course to fly planes on or off, and then must catch up with the fleet quickly or she may be "caught out" by enemy light craft. Hence a speed considerably in excess of fleet speed is necessary. The 25 knots of the *Hermes* is not enough.

(*b*) The same arguments as to speed are applied to the *Eagle* (24 knots). The battleship armor on the *Eagle* (belt) does not save her flying deck and hangar sides and it is expected that her usefulness as a carrier can easily be destroyed.

(*c*) The island arrangement of bridge, mast, funnels, etc., on the *Eagle* and *Hermes* has not proved desirable for landing and handling airplanes on the flying deck, and from the aeronautical point of view the *Argus* (flush deck) is much superior.

(*d*) The *Argus* is small, slow (20 knots) and without adequate armament. It is hence useful for training purposes only.

(*e*) There is no use in maintaining carriers for a few planes. A large number are wanted at a given spot at a given time. Hence the capacity of the carrier should be a maximum. The speed should be 10 knots more than the fleet speed or equal to the cruisers, with whom the carriers will most often be assigned.

A general discussion of the size and speed of aircraft carriers is given in Brassey's Naval Annual, 1924, by Mr. H. G. Williams, of Armstrongs. This article deserves special study because of Mr. Williams's former connection with the Admiralty (late R. C. N. C.) and his present connection with Armstrongs, where the *Furious*, *Eagle*, and *Hermes* were built.

It is evident that Mr. Williams set out to discuss the general design of aircraft carriers past, present, and future in a detached professional manner and that his article has been liberally censored. Notably there is no reference to the present reconversion of the *Furious* to a flush deck aircraft carrier (as she is supposed to be). Also there is no new information as to the *Eagle*, *Hermes*, or *Argus*.

However, "Jane," 1924, states that the *Furious* in her refit at Devonport is having her mast and funnel removed and a new hangar built forward, changing her entire appearance by a reversion to the *Argus* design with clear decks. The same information was obtained independently from two other sources. Nevertheless, it is of interest to recall gossip that the *Eagle* was not considered an entire success on her trials and there is complaint that the *Hermes* is not "very suitable" for aircraft work with the fleet. It is also to be noted that the proposed refit of the *Glorious* and *Courageous* as carriers has been delayed until this year, presumably until the *Eagle* and *Hermes* could be tried in service.

Mr. Williams mentions the *Hermes* as the smallest practicable aircraft carrier to cruise with the fleet and goes on to show the need for higher speed to avoid contact with cruisers, and to regain position with the fleet quickly. He concludes that the treaty allowance will more likely be used up by constructing carriers near the upper limit of displacement.

He then proceeds to discuss the probable dimensions of such carriers based on the various requirements of the problem. It is of interest to note that his first requirement is hangar and landing facility for airplanes. The landing deck is a matter of arrangement of superstructure, funnels, mast, etc., to have a clear deck, and the *Argus* and *Hermes* solutions are available (with preference given to the *Hermes*).

Stowage of airplanes is based on the requirement to bring out any one airplane to the elevator regardless of position. To do this he suggests a hangar height double the stowage height of the plane with clearance for overhead cranes. The fighting planes, requiring less

height, would be stowed over the boilers and the bombers over the machinery space. Taking a 15-foot stowage height for the bomber, he estimates a total depth of ship from keel to flying deck of 68 feet 6 inches. Considering beam necessary for the stability of such a high structure, he estimates, for a 25-foot draft, a beam of 88 feet at W. L. and 98 feet over bulges. The width of hangar should take three airplanes.

Considerations of speed and length lead to a 34½ knot vessel of 900 feet length with H. M. S. *Hood's* machinery and 29,000 tons displacement (26,200 tons standard), carrying 23 bombing and 28 fighting planes.

Armor is 3-inch side belt, 27 by 600 feet long, reducing to 10 feet high at the ends. The top of the hangar is to be 2 inches.

The armament is only eight 8-inch guns, in lieu of the 10 allowed by treaty, in order to get maximum hangar space and avoid complication of magazines. It is stated that armament is secondary in importance. No torpedo tubes are wanted as the ship should never close with an enemy sufficiently to use torpedoes.

A 30,500-ton (standard) carrier (1,000 feet long and 100 feet beam) designed for maximum speed (36.3 knots) is discussed, and another of 32,400 tons (975 feet long by 112 feet beam) designed for maximum stowage capacity (35.75 knots). The question is then raised as to when a carrier becomes a capital ship. Mr. Williams shows how, by carrying a 9.2-inch gun, the carrier must be a capital ship and then can be built up to 35,000 tons standard displacement, or some 26,000 tons larger than is permitted by the treaty for a true aircraft carrier. Such a "maximum carrier" might accommodate 14 bombers and 40 fighters.

The author next considers the possibility of a capital ship with aircraft-carrier features, as proposed by Sir George Thurston in Brassey, 1923 (three 16-inch guns forward with the after part of the ship devoted to airplanes). He explains the impossibility of armoring the high hangar and concludes that the ship is not fit to lie in the line of battle. Such a vessel might be useful on detached service, but, in view of the charge against the treaty limit to capital-ship tonnage, he doubts the wisdom of the compromise.

Mr. Williams concludes that naval design always tends to specialize for special functions.

The proposal made earlier in the paper, that the hangar be double the height of the airplane, gives the opportunity to work a gallery or partial deck along each side of the hangar to hold an additional row of planes on each side, leaving a double height central alley for transporting planes to the elevator. It appears that the *Furious*, of 22,000 tons full-load displacement, 786 to 735 feet length, 89¾ feet beam, 31 knots, is not much inferior to the 26,200-ton ideal carrier

discussed in this paper, and it is possible that the new hangar being built on her may be double airplane height. The sketch indicates that the *Furious* has had her hangar deck raised about a deck height from a point about one-third her length from the bow, where there is a break. The deck forward of this point appears to be about as at present. The break then forms a navigating bridge with view forward only but with wings or platforms projecting beyond the side. No doubt a small navigating bridge of a disappearing type might be fitted for use when planes are not used. The sketch shows an *Argus* type flush deck from the break aft.

It may be pointed out, as a possibility, that the double plane height hangar proposed by Mr. Williams gives the designer space to run a smoke duct aft to the stern along each side overhead. These smoke ducts take the space of the suggested additional outboard rows of planes above the gallery deck. The presence of these ducts should make the hangar a pretty hot place, but strong ventilation is required there anyway to carry off gasoline fumes and to remove the exhaust from airplane engines being tuned up. The uptake leads would not be difficult.

The *Furious* is known to be rebuilding at Devonport. As stated above, there is good reason to believe the ship will finally appear as a flush-deck vessel. It is not known whether the barbettes, originally intended for 18-inch guns, and not removed at her first conversion to a carrier, will now be taken out, but this seems necessary if full hangar space is to be utilized and smoke carried to the stern.

The sketch is not verified but shows smoke coming out aft, yet there is what appears to be a funnel at the side. Unofficial information from a source usually reliable is to the effect that smoke is taken to the stern. Another source, reliability not known, states that side swinging funnels (as in the *Langley*) will be fitted. It is quite possible that both arrangements may be tried as an experiment. It is understood that the bulges on the *Furious* will be increased in depth at this time.

The Admiralty have now announced that the conversion of the *Courageous* and *Glorious* to aircraft carriers will be taken in hand at once. It is understood these vessels will be made identical with the *Furious* with new bulges.

GREAT BRITAIN.

GENERAL ESTIMATE OF PRESENT STATUS OF ROYAL AIR FORCE.

February, 1924.

FOREWORD.

The Air Ministry, a separate department, on an equal footing with the army and navy departments, supplies the aviation material

and personnel for the squadrons cooperating with the army and navy and also for those operating as a separate air force.

The strength of the Royal Air Force in August, 1922, was 32½ squadrons. On August 3, 1922, the Prime Minister officially stated that the government had decided to provide a force of 500 machines for home defense. The additional squadrons authorized at this time were provided for in the air estimates for 1923–24 which provides for 18 new squadrons, which will make a total of 50.

Since the passing of the air estimates for the current year, the Government has authorized an additional 34 squadrons which will be provided for in a supplementary estimate or in the estimates for succeeding years. The total of the authorized squadrons rose from 32½ squadrons in August, 1922, to 84 in June, 1923, an expansion of over 250 per cent.

This expansion will not be completed for about three years due to the necessity of training personnel, and designing, and building suitable types of planes, but the matter of personnel is the prime limiting factor.

BUDGET.

The appropriations for the Royal Air Force for the fiscal year 1923–24 are:

Total net	£12,011,000
Other appropriations in aid	637,000
Receipts from Middle East vote for cost of air force in Palestine, Iraq, and Trans-Jordania	5,957,000
Gross total	18,605,000

The £637,000 appropriations in aid are receipts from Indian Government for technical and warlike stores supplied to the Royal Air Force in India, contributions by Indian Government for home effective services, receipts from sales of material, fees for inspection and tests, receipts from rent of buildings, etc.

The Secretary of State for Air, speaking of the £5,957,000 received from the colonial office, said "Excluding a provision of £916,000 for supplies to British and Indian ground troops the remaining £5,041,000 represents air expenditure proper and also the cost of works and auxiliary services on behalf of both the air force and the ground troops."

The pay and allowances of the British and Indian ground troops are not paid from air force votes and are not included in the remaining £5,041,000.

The British ground troops (1,836 of all ranks) operating with the Royal Air Force in the Middle East are paid by the war office and are repaid by the colonial office from the Middle East vote. The cost

of Indian ground troops is ultimately borne by the colonial office, who reimburse the Indian Government.

NOTE.—The total of the appropriations for the defense of the Middle East is £7,530,000, of which £5,957,000 appears as an appropriation in aid to the air force vote, £553,000 under the army votes for the cost of British combatant troops in the Middle East, and from the remainder the Indian ground troops administered by the air force in the Middle East are paid.

There is, however, some British and Indian Army personnel attached or temporarily lent to the Royal Air Force in Iraq and Palestine who are paid from air force votes, the amount so paid is:

Officers	£81,475
Men	315,000
Total	396,475

The sums received from the colonial office for works in the Middle East is £1,149,000. The war charges contained in the budget total £525,000.

Deducting from the gross budget of £18,605,000 the following:

War charges	£525,000
Pay of British and Indian Army personnel temporarily lent or attached to air force in Middle East	396,475
Supplies to British and Indian ground troops	916,000
Cost of works in Middle East (barracks, petrol storage, flying fields, etc.)	1,149,000

There remains £15,618,525, at normal rate of exchange $76,007,551, which may be taken as the amount of the expenditure of Great Britain on the Royal Air Force, excluding the cost of army ground troops and works in Middle East. This does not include the six squadrons operating in India which are paid by the Indian Government. The Indian Government's budget shows an appropriation of 18,319,000 rupees, which, at 15 rupees to the pound (approximate current rate of exchange), equals £1,122,266.

Of this amount £352,500 appears under British air force votes as appropriations in aid, leaving £769,766, which at normal rate of exchange amounts to $3,741,000, which should be added to the above.

This is believed to be a conservative estimate as the Secretary of State for Air stated in the House of Commons on March 14: "Taking the net figure this year at £18,000,000, applying a one-power standard would increase the expenditure to £23,000,000 at once and to £35,000,000 eventually to keep pace with the growing program of other powers. For a one-power standard it may be assumed that the cost would be £35,000,000 a year net."

PROGRAM AND POLICY.

The statement of the Prime Minister announcing the increase of 500 machines for home defense on August 3, 1922, mentioned in the

foreword, is quoted as follows: "The Government, as a result of an inquiry by the committee of imperial defense, have decided to adopt a scheme submitted by the Air Ministry providing a force of 500 machines for home defense at an increased cost of £2,000,000 per annum. £900,000 out of the total will be found by economies in the estimate of the Air Ministry."

In the statement of March 5, 1923, introducing the air estimates, the Secretary of State for Air says in regard to the above increase:

The true increase on services other than the Middle East is therefore £1,550,500. This increase is due to the scheme of expansion for home defense which has already been reported to Parliament and also to additions to the strength of the air force units allocated to the navy in consequence of the impending completion of new aircraft carriers. The scheme of expansion for home defense involves the formation of 15 new squadrons. This number will not be reached until April, 1925, and only 7 will be formed either completely or in part during the financial year 1923–24. A proportion, however, of the initial expenditure on equipment and accommodation for the other 8 squadrons will be incurred in the coming financial year. The additions to the strength of air units working with the navy amount to three full squadrons and will take full effect in 1923–24.

When the above-mentioned squadrons are completed the total number will be 50.

This increase is reflected particularly in the amount provided for airplanes, seaplanes, engines, and spare parts. The amount this year (£3,620,000) being over twice as much as the amount for last year (£1,524,000), and this increase is due only to the increase of the 18 squadrons, and does not include any provision for the 34 squadrons since authorized. The Secretary of State for Air in introducing the air estimates said:

There is every reason to anticipate that from now on the orders placed by the Air Ministry in ordinary course and on a strict estimate of requirements will be sufficient to maintain an adequate number of firms on a sound and stable basis.

The campaign for further increase continued and resulted in the following announcement by the Prime Minister on June 26, 1923:

The Government has come to the following conclusions with the reference to British air power: In addition to meeting the essential requirements of the navy, army, Indian and overseas commitments, British air power must include a home defense air force of sufficient strength adequately to protect us against air attack by the strongest air force within striking distance of this country.

In the first instance the home defense forces should consist of 52 squadrons, to be created with as little delay as possible and the Secretary of State for Air has been instructed to take the preliminary steps for carrying this decision into effect. The result of this proposal will be to add 34 squadrons to the authorized strength of the Royal Air Force. The details of the organization

will be arranged with a view to the possibility of subsequent expansion, but before any further development is put in hand the question should be reexamined in the light of the then air strengths of foreign powers.

When the above increase is effected the total number of squadrons as before stated will be 84. Taking the strength of a British squadron as 12, with 12 machines in reserve, the number of machines required to provide for this force will be 24 by 84 equals 2,016.

The Secretary of State for Air said that the extra expenditure involved this year as a result of the above scheme would not exceed £500,000 and the average expenditure on this extension including both capital and maintenance would not be more than £5,500,000. That expenditure would not be reached until probably three years and in the next year and the year following the expenditure will be considerably less than the full average expenditure of £5,500,000.

The Secretary of State for Air also stated that he expected the expansion of personnel to keep up with the expansion of material.

Speaking of this expansion on October 18, 1923, the Secretary of State for Air made the following statement:

We want to make the new force as efficient as possible, but we also want to organize it as economically as possible. Speaking generally, we are going to have three kinds of squadrons. In the first place there will be a backbone of highly trained regular squadrons for the difficult work of fighting, but in the second place there will be special reserve squadrons and auxiliary squadrons for the less difficult work of bombing. The reserve squadrons will be maintained on approximately one-third regular personnel and two-thirds reserve personnel, the reserve personnel to be obtained by the enlistment of skilled artisans, who will come up for short periods of training in the immediate neighborhood in which they live. The auxiliary squadrons will be manned and organized on a basis somewhat similar to that of the territorial army, each squadron being provided with a small nucleus of regular personnel for instructional and administrational purposes. Otherwise they will be composed entirely of nonregular personnel, and the units will be linked with the large industrial centers.

We hope to be able to carry out a great deal of the work of these three kinds of squadrons that is now carried out by regular personnel, by civilian personnel. In the regular squadrons we hope to be able to carry out at least 25 per cent of the work—that is, almost all the nontechnical work—by civilian labor. For almost all the regular squadrons, for all the special reserve squadrons, and all the auxiliary squadrons it is hoped that all the repair work, other than minor running repairs, will be carried out entirely by civilian labor, and that all additional stores depots that may be required will be manned by civilians.

The result of these arrangements will be to give us for the first time a substantial air force for home defense with an increase of considerably less than 10,000 officers and men in the ranks of the Royal Air Force. That is to say, we hope to double our air power with an addition of only one-third of its present personnel.

PERSONNEL.

The strength of the Royal Air Force on October 1, 1923, was:

Officers	3,152
Men	26,488
Total	29,640

The above figure includes 207 officers and 1,716 airmen of the Royal Air Force lent to India and paid by the Indian Government. It does not include British and Indian ground troops in the Middle East, paid from the Middle East vote. The number of such troops as shown in army estimates, 1923–24, was: British troops—two battalions of 887 each and 62 other corps and departments; Indian troops—10,500. The British troops were to be reduced by one battalion. It does not include other British and Indian Army personnel temporarily lent or attached to Royal Air Force in Middle East. The establishment provided in the air force estimates including army personnel attached but exclusive of those serving in India is 33,000.

NUMBER OF PILOTS.

On March 14, 1923, the number of officers was 3,288 (practically the same as on October 1), of these 1,579 were actually engaged in flying the machines in commission, 2,599 were liable to fly, the others were either older officers past the flying age or officers like store officers and other technical branches.

On October 1, 1923, there were 2,406 officers in the general duties branch. This branch is the flying branch for those who are liable to fly, but not necessarily pilots.

On July 25, 1922, Secretary of State for Air said there were 1,714 fully trained pilots and 109 observers in Royal Air Force, of which about 20 per cent were employed on work with the navy. He said:

PERSONNEL RESERVE.

I come now to the question of reserves. If our small force is to expand quickly the problem of reserves is obviously of vital importance.

I think the honorable members will be glad to see for the first time in the air estimates for this year a special vote devoted to the air force reserve. They will see the details set out in vote 7 and also that during the year we hope to have an average strength on the reserve of about 500 officers and between 7,000 and 8,000 men. In this connection we are hoping to carry through a scheme for enabling officers and men of the reserve to train with a certain number of selected aviation firms. It may be necessary in the future to supplement these provisions by setting up some kind of auxiliary air force. * * * By these means we hope to build up in the course of the next two or three years a reserve of 1,000 officers and 12,000 men.—(March 14, parliamentary debates.)

The authorized number of air force reserves for the year 1923–24 is 700 officers and 12,000 men. The average strength provided for is 493 officers and 7,644 men. The actual strength on October 1, 1923, was: Officers, 568; men, unknown.

COOPERATION WITH THE NAVY.

When the three new squadrons to be assigned to cooperate with the navy, which have been or will be formed this year, are completed, there will be eight squadrons assigned to work with the navy.

The Admiralty states that on October 1 there were 319 officers and 1,907 men assigned to naval aviation, but this does not include any proportion of the personnel under training at the various schools and stations, on duty at the air ministry, supply depots, manufacturing plants, etc. An unknown proportion should be added to afford a comparison with the personnel assigned to United States naval aviation.

PROGRESS OF NAVAL AVIATION.

On March 14, 1923, the Secretary of State for Air said: "A great part of our research work has been devoted to naval work. Many of our best types of machines have been made for naval work. Our naval air work is many stages ahead of the naval air work of any other greater power; whether it be in the matter of deck landings, of torpedo attacks from the air, or of long distance flights by flying boats, our naval work is stages ahead of the naval work of any other great naval power."

MISCELLANEOUS.

A British squadron consists of 12 machines with 12 machines in reserve in case of home service squadrons and 24 in case of squadrons abroad.

Practically all machines for Royal Air Force are manufactured by private companies.

Following table shows total personnel engaged in aviation in Army and Navy of the United States as of October 1, 1923:

	Army.	Navy.	Marine Corps.	Total.
Officers	917	515	66	1,498
Enlisted men	8,764	3,309	712	12,785
Total	9,781	3,824	778	14,383
Civilian employees, Washington	144	86	------	230
Civilian employees in field	2,877	2,225	------	5,102
Grand total	12,802	6,135	778	19,715

The above grand total includes every employee of the Army, Navy, and Marine Corps engaged in aviation except the officers and men

for general service, i. e., ships' crews of aircraft carriers and tenders. The number of these on October 1, 1923, was 69 officers and 907 men.

Comparative data on aviation personnel.

ENLISTED MEN.

	Army.	Navy and Marine Corps.	Total.
United States	8, 764	4, 021	12, 785
Great Britain			26, 488
OFFICERS.			
United States	917	581	1, 498
Great Britain			3, 152
OFFICERS, ENLISTED MEN, AND CIVILIANS.			
United States	12, 802	6, 913	19, 715
Great Britain			37, 179

GREAT BRITAIN.

NAVAL WAR STAFF COURSE.

January, 1924.

(Quoted from recent Admiralty fleet order.)

The war staff course is being conducted at the Royal Naval College, Greenwich: 26 officers, including one lieutenant, Royal Australian Navy; one lieutenant, Royal Canadian Navy; and two marine officers, are attending the course at present.

The objects of the war staff course are two:

(*a*) To train war staff officers.

(*b*) To provide a higher naval education.

It is necessary to point out that the war staff qualification is one which may be obtained by any executive officer, whatever his specialist branch, and that it is in no way parallel to any such specialist qualification. Officers of all branches are trained together at the staff college, thus insuring that pooling of knowledge and experience which is necessary for the formation of a common doctrine, founded upon a correct appreciation of the capabilities of the various weapons of naval warfare.

It will be realized, therefore, that, apart from training for staff duties, this course is of high educational value to any officer who desires to study his profession and aspires to rise to the higher ranks of the service.

The course is open to officers of the executive branch and marine officers.

Selections for the war staff course are made with due regard to the present employment and prospects of promotion of each officer concerned.

In order to avoid difficulties in making application, which have sometimes been experienced, and to afford greater ease in selecting a due proportion of officers from each branch, it has been decided that in future application for each course may be made at any time in the 12 months previous to May 1 of the year in which the course begins. There will be no objection to an officer withdrawing his application should he so desire.

The next course will begin on September 23, 1924, and last about one year. Applications should be forwarded through the usual channels, so as to reach the secretary of the Admiralty not later than May 1, 1924.

Any officer of the executive branch may send in an application after reaching six years' seniority as lieutenant, but selection will, as a general rule, be confined to commanders, lieutenant commanders, and lieutenants of more than seven years' seniority. Those who have applied for previous courses are not debarred, but fresh applications are required.

Marine officers may apply after the age of 25.

Each applicant must be recommended by his commanding officer, who should include in his recommendations answers to the following questions:

(*a*) Date of birth, rank, and seniority of officer applying.

(*b*) Is the officer's ability as a general service officer considered to be exceptional, above the average, or average?

(*c*) Has the officer any experience of staff work? If so, of what kind? (State the particular branch of war staff or technical staff, in accordance with A. F. O. 1367C/19 on naval staff organization.)

(*d*) Is the officer's intellectual ability considered to be exceptional, above the average, or average?

(*e*) Is he accurate? Is he able to express himself clearly and quickly?

(*f*) Would the commanding officer desire to have this officer, when trained, on his own staff? If not, why not?

(*g*) Is he of sound constitution and physically fit in the following:

(i) General physical fitness.

(ii) Eyesight.

(iii) Hearing.

(*h*) Does he possess knowledge of any foreign languages; if so, which?

(*i*) General remarks of commanding officer.

Applicants may also, should they desire, apply to officers under whom they have served during the previous four years for recommendations, which, if obtained, should be forwarded through the usual channels.

GREAT BRITAIN.

NOTES ON H. M. S. "EMERALD."

January, 1924.

The ship was structurally completed at Elswick and towed to Chatham for completion. No armament or outfit was on board. When inspected, work was progressing very slowly, due to lack of funds, in preparing gun foundations and cutting holes for electrical and ventilating leads. A general inspection showed that the sketch of the *Emerald* given by "Jane's Fighting Ships, 1924," is substantially correct as to the arrangement of the battery, but is incorrect in certain particulars. The fire-control top instead of being as shown by "Jane" (two platforms) will in the actual ship consist of one splinter-proof house on the top of the tripod mast. There will be the usual topmast, but no mainmast is to be fitted. Amidships between the second and third funnels a searchlight control station is shown in "Jane's" sketch. This location is retained for the searchlights, but the searchlight control house will consist of a splinter-proof house, mounted on legs above the deck, carrying a searchlight at each corner. Abaft of this house will be a cylindrical tower with the top open for antiaircraft gun control.

The space between No. 2 and No. 3 funnels is caused by the location in that region of a forward engine room and a magazine. There is a handling room for both 4-inch and 6-inch ammunition with magazine and shell rooms under. Shells are passed by hand into the handling room and thence into the 4-inch and 6-inch hoists to the upper deck. The hoists are electrically operated. The magazine spaces were stated to be separated by a ventilated air space from the hot compartments, with ventilating air supplied to the magazine, passing through cold brine coils for temperature regulation. Due to a desire to obtain high freeboard, the deck heights are more than ample, in fact they are wasteful of space in the living quarters. Crew space is forward, officers aft, and shops and machinery division spaces between.

No information was obtainable as to torpedo storage and handling rooms and the trip through the vessel was somewhat hurried by the escort. However, the foundations for four triple torpedo tubes were observed to be substantially as shown by "Jane's" sketch.

The trawler bow combines a sharp shear with flare and is understood to have been somewhat exaggerated in the *Emerald* class because of rather unsatisfactory experience with the C and D classes of light cruisers with fine entry. It is understood that the C and D classes were very wet when driven at high speed in a seaway. The sharp shear of the bow prevents the forward 6-inch gun firing directly forward when level, but No. 2 gun is mounted high enough to permit unrestricted bow fire. It is noted that a very heavy blast screen and spray screen is fitted around the platform which mounts No. 2, 6-inch gun, as around No. 6, 6-inch gun.

Foundations for seven 6-inch guns were noted as shown in "Jane," 1924. There is evidently no intention of fitting twin mounts fore and aft as has been rumored, as all foundation circles appear to be of the same diameter.

The location of two 4-inch antiaircraft guns shown in "Jane" was not confirmed. No foundations were to be seen and inquiry met the response that "antiaircraft outfit is being reconsidered and the dockyard has not been informed of the final arrangement."

Torpedo tubes were not installed but will presumably be fitted as shown in "Jane" as four triple-deck tubes.

The tripod mast legs are of 15 or 20-pound plating about 24 inches in diameter, not tapered. The longitudinal seam is strapped on the inside by a T-bar, single riveting. Opposite the T-bar forming a seam strap is an identical T-bar fitted as a stiffener. It was stated that the two T-bars were connected at 3-foot intervals by struts bolted in place. Bolting was done because of the difficulty of riveting inside. The T-bars and struts are considered necessary to avoid crippling of a leg when damaged. Access to the top is impossible from the inside of a mast leg on ships of this size. External rungs are fitted to one leg as a ladder. None of the legs are vertical, the forward leg raking aft about 5°.

The top is a splinter-proof house sitting on the apex of the tripod with support by deep radially projecting gussets. These gussets extend several feet beyond the floor of the house as anchorage points for stays to the topmast. The top is about 6 feet wide by 12 to 15 feet long, dimensions estimated by eye. The floor is stated to be 1 inch, the sides half an inch, and the roof 15 pounds S. T. steel. No splinter mattresses are required. It was stated that complete fire-control apparatus for 6-inch battery will be mounted in this top. The 4-inch guns will be controlled from amidships. There is no plotting room or other fire-control space reserved below decks.

The roof of the top slants away from a ridge. There is a window about a foot high running all round the top at the height of a man's head, the upper edge some 6 inches below the roof. This window is to be fitted with sliding shutters of steel. The shutters were said to slide up and down as in a closed body motor car.

Aft of the last smoke pipe, where one would expect the mainmast, is a flying-off platform on a turntable. This platform is shaped like a cross and is of wood with steel beams beneath. It resembles the platforms mounted on turrets in general type. The airplane, presumably a high-powered fighting plane which can take the air with little run, is held by a quick release device in the usual manner. The side arms of the cross are to support the wings and so hold the plane horizontal when carried on the platform at sea with relative wind not along the axis of the platform. The platform is mounted on a conical plate structure about 12 feet above the deck, on the top of which is a central centering pivot with very large clearance, a roller path of 4 feet radius and another or outer roller path of 10 feet radius (estimated). The rollers are roughly made and of about 3 inches diameter, spaced 2 feet apart. Holding-down clips with some one-fourth inch clearance prevent the platform blowing away.

It may be observed here that only very light and high powered planes (fighters) can be used with such a platform. Presumably land planes are intended to be used, in which case the cruiser will stay with the carrier in order that the planes may land on board.

No derrick for lifting the planes to the platform had yet been fitted, and it was stated that this problem had proved difficult. It was proposed to fit a boom which normally would lie on deck and be raised by a small crane when wanted. The design had not yet been supplied to the dockyard.

Each engine room has two geared turbine (Brown-Curtis) units. Total stated horsepower 80,000 equals 33 /32 knots. The high pressure and low pressure turbines and condenser are nested close together. The clearance over the turbines and gear housings is so great that casings may be lifted from a trolley secured to the deck overhead. There is no engine-room hatch. To remove a large turbine part from the ship, the deck could be removed at a place where provision is made for this. The engine rooms are very roomy.

The boiler rooms have 8 Yarrow small tube boilers arranged transversely. Oil fuel only is used, the tanks being outboard against the sides of the ship. This gives two skins at the side. Forced draft is the closed fireroom system with the usual blowers, and air locks for access. Fresh water is carried in the doubled bottoms. Feed pumps are in the boiler rooms.

The arrangement of armor is substantially as shown in "Janes," 1924, sketch. The side belt is 2-inch S. T. steel worked over 40-

pound ship plates. The armor tapers off forward and aft to 1½ inches. Deck protection is very meager, consisting of 1-inch S. T. steel over the steering engine and 1 inch over the amidship engine room. This is worked flush by 30 pound or 20 pound plates riveted together, one plate acting as a seam and butt strap for the other. The 6-inch guns are stated to have light shields only.

Between the second and third smoke pipes is an elevated house stated to be used for control of antiaircraft guns and searchlights. It is large enough for a party of six men, and in general arrangement is similar to the top. The sides and roof are about 15 or 20 pound plate with a 1-foot opening running clear around it at the height of a man's head. As there are only two 4-inch guns and four triple torpedo tubes, it is more likely that torpedoes and searchlights are directed here. There was considerable reticence on the part of the guides to discuss this house, but no signs of a range-finder foundation could be seen nor any means for access to the roof. There was a 5-foot high cylindrical tower of 15-pound plate, open at the top, with side door for access mounted on the center line amidships. This was stated to be for a range finder, but is more likely for antiaircraft gun control.

Officers quarters (staterooms) are heated only by portable electric stoves. Ventilation is cold air discharged by pipe to each room. Crew space is heated by steam coils in the ventilation system. The crews head is forward and high with wire mesh doors opening on deck. The place should be very cold but no ventilation is required. Officers head and baths are at the end of the ship in the wardroom country. Pipe bunks are not used, the only bunks being in staterooms for officers and warrants.

No provision against poison gas is evident, but a supply of gas masks for the crew was said to be on the allowance list.

It was pointed out as an innovation (to the British) that the ship was arranged for a central store keeping system and a general mess with one galley.

The radio leads up from the radio room under the main deck under one wing of the flying-off platform. To avoid this interference, the lead then goes aft some 10 feet along the deck in a large steel box and then rises vertically to join the aerial which leads off from the foretop mast and is stayed to the side of the ship at a point where interference with the after 6-inch guns is not encountered. This arrangement was evidently adopted after the ship was designed, and probably resulted from substitution of the flying platform for a mainmast.

No boat-handling gear was fitted. The ship is designed as a flagship with admiral's quarters.

The hull construction is in general light, and it appears that great pains have been taken to keep down structural weights. There is no more extensive welding in the structure of the ship than on United States vessels. A novel water-tight door was, however, noticed in which the plate forming the door was stiffened by two $\frac{1}{4}$ by 3 inch bars forming an X well welded to the plate.

Water-tight subdivision seems to have been carefully carried out, and bulkheads are not pierced by doors below the first deck above the water line, which is some 10 feet above. All fore and aft traffic on this ship must go along this deck. The transverse bulkheads extend, of course, to the main deck, but have doors in them only on the first deck below the main deck. There are no power-operated doors.

GREAT BRITAIN.

R. A. F. ESTABLISHMENT OF PLANES AND PERSONNEL FOR VARIOUS TYPES OF AIR SQUADRONS.

February, 1924.

Establishment of planes and personnel for various types of squadrons of British Royal Air Force:

1. ARMY COOPERATION SQUADRON (HOME).

Number of flights per squadron.	Number of active planes per squadron.	Personnel.			Total.
		Officers.	Men.	Civilian subordinates.	
3	12 landplanes:				
	Headquarters	7	102	.....	109
	Three flights	15	39	.....	54
	Total for squadron	22	141		163
	Medical personnel	1	3		4

2. ARMY COOPERATION SQUADRON (IRAQ).

3	12 landplanes:				
	Headquarters	6	71	32	109
	Three flights	15	36	3	54
	Total for squadron	21	107	35	163

3. BOMBING SQUADRON (SINGLE ENGINE) (HOME).

3	12 landplanes:				
	Headquarters	7	97	.....	104
	Three flights	15	39	.....	54
	Total for squadron	22	136		158
	Medical personnel	1	3		4

4. BOMBING SQUADRON (SINGLE ENGINE) (IRAQ).

Number of flights per squadron.	Number of active planes per squadron.	Personnel.			Total.
		Officers.	Men.	Civilian subordinates.	
3	12 landplanes:				
	Headquarters	6	72	32	110
	Three flights	15	36	3	54
	Total for squadron	21	108	35	164

5. BOMBING SQUADRON (TWIN ENGINE), CLASS "B" (HOME DEFENSE).

2	10 landplanes:				
	Headquarters	5	121		126
	Two flights	20	50		70
	Total for squadron	25	171		196

6. BOMBING SQUADRON (TWIN ENGINE) IRAQ.

2	10 landplanes:				
	Headquarters	6	75	37	118
	Two flights	20	50	2	72
	Total for squadron	26	125	39	190

7. SINGLE SEATER FIGHTER SQUADRON (HOME).

3	12 airplanes:				
	Headquarters	5	92		97
	Three flights	12	33		45
	Total for squadron	17	125		142
3	12 landplanes:				
	Headquarters	6	60	26	92
	Three flights	12	33	3	48
	Total for squadron	18	93	29	140

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NAVAL AVIATION.

Royal Air Force (Gosport).

1. DEVELOPMENT FLIGHTS.

Number of flights.	Planes per flight.	Personnel per flight.			
		Officers.	Men.	Civilians.	Total.
1	3 torpedo planes and 1 in reserve	3	27	-------	30

2. FLEET SPOTTING FLIGHTS.

4	6 ship planes	[1] 13	39	-------	52

3. TORPEDO FLIGHTS.

2	6 ship planes	7	27	-------	34

[1] 6 of these are naval officers.

NOTE.—The above does not include headquarters personnel amounting to 15 officers and 187 men, medical personnel of 1 officer and 3 men; store station of 1 officer and 12 men; pay and accounting section of 2 officers and 8 men; workshops of 1 officer and 48 men. The officer commanding the torpedo flights and the officer commanding spotting flights are attached to base headquarters.

Royal Air Force (Lenchars).

1. FLEET RECONNAISSANCE FLIGHTS.

Number of flights.	Planes per flight.	Personnel per flight.			
		Officers.	Men.	Civilians.	Total.
4	6	13	37	-------	50

2. FLEET FIGHTERS.

4	6	7	27	-------	34

In addition to the personnel shown per flight, the Royal Air Force base, Lenchars has the following additional personnel: Headquarters, 19 officers and 113 men; stores section 2 officers and 14 men; pay and accounting section 2 officers and 9 men; workshops 1 officer and 45 men; medical 1 officer and 3 men.

The Royal Air Force, Gosport, and Royal Air Force, Lenchars, supply aviation material and personnel to carriers; there is in addition 1 flight at Malta and approximately 1 flight attached to the *Pegasus*.

GREAT BRITAIN.

R. A. F., TRAINING STATION, HALTON.

January, 1924.

This school is located about 3 miles from Tring, and 35 miles northwest of London. It was established during the latter part of the war. The grounds were taken over from the Rothschild estate, and consist of about 3,000 acres upon which were originally located a large country residence and several smaller houses, stables, etc. The original additional buildings were war-time construction, and are being gradually replaced by buildings of a permanent character. Permanent quarters now exist for something over 2,000 men and necessary schoolrooms, shops, and offices are also of a permanent character. The new estimates include approximately £180,000 for a new hospital and for quarters for medical officers.

The station is in command of Vice Air Marshal Scharlett, who was formerly a captain of the regular navy. The personnel consists of about 100 officers, 1,000 station personnel and 2,000 boys under training. An additional 800 boys will be taken in during the latter part of this month. The course of training is practically identical with that at Cranwell, without however the inclusion of any cadets. The actual flying is, therefore, limited to that done in connection with giving the boys an idea of what flying is like and, therefore, impressing upon them the importance of the groundwork on the planes. Great emphasis is laid upon military drill. A church parade was witnessed and the performance gave an excellent impression. Very strong emphasis is also laid on sports, and ample facilities for most of the English sports are available.

Although the visit was very short and was on the personal invitation of the commanding officer, there was time to gain the distinct impression that the station was conducted in rather an extravagant manner. The number of officers and men in proportion to the number of boys under training seemed excessive. This was no doubt due in part to the character of the property which is in reality a beautifully laid out country estate and requires a vast amount of upkeep.

The fact that 800 boys are included in the new class indicates that a certain amount of progress is now being made in increased personnel for air force. Classes enter twice a year, and the course is three years. On the basis of 800 men per class, this would bring the total number of boys up to 4,800. As this number is beyond the facilities of the station and the attitude of even the present Government was against much further expansion of air force

facilities in the way of buildings, it is believed that the new class is a special one and subsequent classes will not be so large.

The present commanding officer gives up command during March and will be succeeded by Air Commodore Lamb, who was also formerly a captain of the regular navy.

GREAT BRITAIN.

REPORT OF INSPECTION OF WORKS OF NAPIER COMPANY.

February, 1924.

The primary reason for this inspection was to ascertain what development had been made in the Napier "Cub." This engine passed its airworthiness test some two weeks ago.

The test shed of the Napier Co. has been considerably enlarged since last inspection. It now contains 10 tests stands, 8 of which are for Napier "Lions," one for the "Lioness," and one for the "Cub." The new stands are a great improvement over the old ones in regard to type and firmness of mounting. All loads are taken up with water brakes. All engines are started with the R. A. E. starter, and the usual systems of cooling and taking care of exhaust gases are carried out.

A Napier "Cub" was running on the test stand, but as it was a new engine, it was only being run at about 1,200 revolutions with light load. Inquiry disclosed the fact that the principal delays in the development of the "Cub" were due to difficulties with the reduction gear, which is of the ordinary spur type, reducing the engine speed of 1,800 revolutions down to a propeller speed of 750 revolutions. Many different forms of English steel were used and the difficulties were said to have finally been solved by the adoption of a special Swedish steel. One engine was torn down for examination, and it was observed that three teeth of the large gear of this engine had chipped. Upon inquiry it was stated that this gear was made of the English steel.

Other modifications in the "Cub" are rearrangement of carbureters and manifolds so that all carbureters are at the rear end of the engine, and the top pair are considerably higher than they were in the old design. The water jackets have been slightly increased in size.

On the previous inspection it was noted that some "Cub" pistons showed signs of burning, and it is believed that the original "Cub" overheated.

The following information was given by the representative of the company who acted as guide:

Weight of engine (pounds)	2,240
Horsepower at 1,800 revolutions	1,000
Horsepower at 2,000 revolutions	1,200

(NOTE.—No consumption figures were given.)

This representative stated that the Air Ministry had agreed to the sale of "Cub" engines to foreign governments, and promised to supply full details regarding general arrangements, performances, etc., as soon as this data is available. Eight of these engines have been built. The price on small orders, of not less than two, will be approximately £8,000 per engine. It is understood that the Japanese are negotiating for the purchase of at least two "Cubs."

Opportunity was had to make quick examination of the Napier "Lioness" while passing through the works. This engine is classed by the Air Ministry as "secret," and the Napier Co. is not permitted to disclose any of its features. The reasons for such secrecy were not observed, as it appears to be merely an inverted "Lion" with the necessary alterations on account of such inversion, such as modification of crank cases, oiling systems, etc. For some reason, both the gear and compression ratios have been modified. The gear ratio was said to be about 2,000 revolutions to 900 revolutions as against 2,000 revolutions to approximately 1,350 of the "Lion." The compression ratio was said to be 5.3 as against 5.55 of the present "Lion." It was stated that the "Lioness" was built upon instructions from the Air Ministry for installation in a new design of two-seater "fighter," but the manufacturers professed ignorance as to who was building the plane. The "Lioness" has not yet passed its airworthiness test, although the manufacturers stated that it was a very successful design and they anticipated no difficulty.

The Napier plant is now given over almost entirely to the manufacture of aircraft engines. Its car production is practically nil. The output at the present time is said to be about 50 engines per month, and the sales manager stated that they had on band sufficient orders to last one year at this rate of production. He further stated that the principal customer outside Great Britain was Japan, but would not state the number of engines that country had bought or ordered. He did state that 50 new Napier "Lions" were in storage in Tokyo at the time of the earthquake, and were wrecked by the fire. When asked as to the possibility of the Japanese copying the Napier "Lion" or making offers to the company to establish a factory in Japan, he stated that so far they had made no effort to copy nor had they suggested the establishment of a factory, but that the

Napier Co. was negotiating with three other countries in regard to the establishment of such a factory. He would not give the names of these countries, but said enough to lead to the belief that they are Russia, Italy, and Spain.

GREAT BRITAIN.

ROYAL NAVAL ENGINEERING COLLEGE, KEYHAM.

January, 1924.

The Admiralty has definitely abandoned the so-called Fisher plan of having engineer officers and executive (deck) officers interchangeable, and has returned to the plan of providing officers for engineering duty only as outlined herein.

The Royal Naval Engineering College at Keyham, Devonport, was opened in 1880 and was operated in connection with the Marlborough until 1888 when the Marlborough was abolished. Since that time, with the exception of a short time during the war, the Royal Naval Engineering College at Keyham has been the engineering school for the Royal Navy.

Midshipmen entered for the navy are given a four-year course at Dartmouth followed by one year on the *Thunderer*. During this time they acquire a small knowledge of engineering subjects. During the period of one year on the *Thunderer*, those who desire volunteer for the engineering course which will qualify them for engineering duty only, and from those volunteering 14 are selected every four months for transfer to Keyham where the course has now been extended to four years. The average age of midshipmen entering Keyham is 18 years, and the average graduating age is 22, and from those who stand especially high on their final passing-out examinations at Keyham a number are selected from each graduating term for an additional engineering course of two years at Greenwich. The number selected from each term depends upon the service requirements, but generally two or three.

The two years' course at Greenwich is devoted to theoretical and designing engineering and from the Greenwich graduates are taken practically all of the designing engineers in the engineering staff of the Admiralty, as well as at the Admiralty dockyards.

Students graduating from Keyham who are not selected for the Greenwich course are sent to the *Vernon* for four months for an intensive course of study in electrical appliances and instruments and their use in the service. The *Vernon* is fitted with all of the up-to-date electrical appliances used in the Royal Navy, and this period

on the *Vernon* has been provided in view of the fact that under the new engineering plan the engineer officers of the Royal Navy are the electrical officers aboard ship in lieu of the torpedo officers being the electrical officers, which was the previous practice.

The wastage at Keyham amounts to practically nothing. Now and then one man from each term drops out on account of inability to keep up with the course, but this does not often happen.

The present course at Keyham has been in effect for only two years, so that there will be no graduates from this college until about two years from date except a few who are completing their courses at Keyham under the old plan.

The instruction at Keyham consists of lectures, practical work with machine tools, running steam consumption, and power tests, etc., on boilers, evaporators, dynamos, ice machines and Diesel engines, practical work in the chemical and physical laboratories. As a part of the buildings of the Engineering College there is a small boiler room containing one small Yarrow and one small Babcock & Wilcox boiler removed from some of the smaller ships in the Royal Navy. These boilers are coal burning, but each one is fitted with one air register and oil burner to accelerate the rate of combustion, and to provide instruction and practice in burning fuel oil. Forced draft is provided in this boiler room, but it does not exceed 1½ inches of water. The machine shop is well equipped with machine tools which, however, are not of a modern and up-to-date pattern, practically all of them being belt-driven from overhead shafting. The machine shop contains as well a Bolinders oil engine, a small ex-German Diesel engine, air pumps, feed tanks with water-measuring tanks, ice machine, evaporators, and dynamos. This machinery also is not of the latest type, its purpose being to teach the students under instruction how to operate and to run quantitative tests on various types of machinery. The students have full opportunity to inspect and become familiar and operate modern machine tools and modern naval equipment afloat, from visits to the ships under repair at Keyham and Devonport, and from observing and working on items of main and auxiliary machinery under repair in the dockyard shops.

The chemical laboratory is equipped for making analyses of all classes of materials used in naval engineering with cameras and microscopes and a developing and printing outfit for metallographic work, with two small resistance electric furnaces equipped with pyrometers for heating specimens for tests. There is being purchased one vertical gradient heat electric furnace to insure the accurate control and gradual cooling of the test pieces under experiment. Lieutenant Commander Sexton of the corps of instructors,

the metallurgist and metallographer of the school, stated that their experience with the usual type of electric resistance furnace had clearly demonstrated that there might be as much as 100° temperature difference in the various parts of the furnace, and that absolute control of the gradual cooling of the specimens could not be guaranteed in the usual type of electric furnace.

The chemical laboratory is also equipped with a small coke-fired crucible furnace for melting nonferrous metals. The physical laboratory was equipped with the usual type of testing machines. It was noted that the machine for determining the tensile strength and yield point was a 50-ton single lever machine which differs from the type of machine used in the United States. There were also noted two Brinnell hardness testing machines and one alternating stresses fatigue testing machine.

The course in mechanical drawing and machine design takes the students up to the point where they are competent to design some simple mechanism, and for this purpose some mechanism already in use is selected and is independently designed by the student, after which a critical comparison is made between the student's design and the original design of the mechanism, where errors or perhaps improvements on the original design can be pointed out. No attempt is made at Keyham to cover original design, the whole idea of the course at this college being to provide men who will become successful operating engineers in the fleet.

At present the following comprises the personnel at Keyham:

Instructors (naval officers)	13
Instructors (civilians)	3
Mechanics (naval pensioners)	10
Officers under instruction (8 classes)	107

This staff of 16 instructors and 10 mechanics covers present requirements, but as the course advances and the number of officers under training increases the instructional staff will be increased as necessary. The senior members of the instructional staff are:

Capt. Barns Morison, R. N., in charge.

Commander Ashton, R. N., executive.

Commander Ord, officer in charge of instruction.

Lieutenant Commander Sexton, metallurgist and metallographer.

The course is expected to provide 42 officers for engineering duty only each year for the Royal Navy, 14 graduating each four months upon completion of their four years' course.

The impression that the staff of instructors made was that they had been selected not only for their ability as engineer officers, but also for their ability as instructors. Lieutenant Commander Sexton, who is a member of the corps of naval instructors, is in charge of the chemical and physical laboratories. He had a thorough knowl-

edge on the practical lines of his profession, and showed keen interest in any new developments, one of the questions which he asked being what success the United States Navy had had in producing castings by the centrifugal process and where those castings were used. He stated that while he had no practical knowledge of the process, and that as far as he knew it was not used in any of the Royal Navy ships he had read a great deal about the process, was thoroughly convinced of its desirability, and had made recommendations for the adoption of this process in the Royal Navy.

GREAT BRITAIN.

SUMMARY OF BRITISH NAVAL AVIATION DURING 1923.

January, 1924.

The fact that all British aviation is under one head makes it rather difficult to study the problem from the American point of view and makes it particularly difficult to obtain first-hand information regarding aviation in the British fleet, due to the fact that the responsibility for such aviation is shared jointly by the Air Ministry and the Admiralty, and each takes this as an excuse for refusal to divulge information. The Air Ministry and the Royal Air Force have not been in existence sufficiently long to have thoroughly settled down. Furthermore, the administrative personnel in a large number of cases are lacking in broad administrative experience. If the air force survives, and it now appears that it will survive, this difficulty will be overcome in time.

The Air Ministry, under the Secretary of State for Air, Sir Samuel Hoare, has held its own in a political way and during the past year has successfully withstood a violent attack by the Admiralty and its supporters. Sir Samuel Hoare is a very able politician and has well represented the case of the air force both on the floor of the House of Commons and in many public speeches. The Duke of Sutherland, who by virtue of title and position represents the air force in the House of Lords, is energetic, pleasing in manner, and rather popular. He is young, but seems to possess the confidence of both the Government and the air force. When the present cabinet was formed under the leadership of Mr. Baldwin, the office of Secretary of State for Air was advanced to one of cabinet rank. This action added greatly to the political strength of the Air Ministry. There is no doubt that both the War Office and the Admiralty look upon the Air Ministry as a rather objectionable upstart, but they are gradually becoming reconciled to the fact that it is here to stay.

The effort of the Admiralty, largely supported by the press, to practically remove the naval side of aviation from the air force, failed. It failed to obtain more than a part of its object. It is believed that this effort will also be renewed at such time as may be regarded most favorable.

Different opinions prevail as to the effect of a Labor Government on the air force. Some believe that it will be increased at the cost of the navy, while others believe that the present plans will be carried through. There seems no reason to believe that it will in any way be reduced.

The total appropriation for the Air Ministry for the present fiscal year, including appropriations in aid, amounts to approximately £18,000,000. This amount appears to be sufficient, but its subdivision has been subject to a considerable amount of criticism. There is a very strong feeling in Parliament that the Air Ministry is very wasteful, and this feeling appears to be largely justified. There is a rather general feeling among civilian air critics, manufacturers, etc., that the Air Ministry does not sufficiently encourage research and experimental development by the manufacturers, and that a large proportion of the money actually expended on such work is expended by the Government establishment at Farnborough and is, in many cases, wasted.

It is difficult to say just what the air force has accomplished in the way of technical research. The general impression prevails that this particular department of the Air Ministry is undoubtedly inefficient, and as a result England is falling behind France and America in aeronautical development. Based on personal acquaintanceship with some of the members of the department of research and further on personal investigations with regard to Air Ministry research work, the writer is of the opinion that this department is lamentably weak and that its greatest point of weakness is its complete self-satisfaction.

The Royal aircraft establishment at Farnborough carries on a considerable amount of research and development work, but some of this work could be carried on more efficiently and more economically at private manufacturing plants. Whether this is the fault of the Air Ministry or the fault of the royal aircraft establishment it has been impossible to ascertain; but it appears that the spirit prevails in the royal air establishment that, if any new subject develops, it must be experimented with at the royal aircraft establishment. This covers such questions as metal propellers, metal wings, etc., on both of which the royal aircraft establishment are spending large sums of money, and for neither of which are they properly equipped to develop. Considerable progress has been made in the develop-

ment of instruments, such as compasses, turn indicators, engine indicators, etc.

Engine development during the past year has consisted principally of improving types already in existence. No new types have been brought out. In the water-cooled field the Napier "Lion" has been considerably improved by the elimination of small mechanical defects; the Rolls-Royce "Condor" has passed its air-worthiness tests and has been considerably increased in horsepower. The Napier Co. has continued its struggle with the "Cub." This last-named engine is giving a great deal of difficulty, and the Napier Co. refuses to even predict when it will be ready for general service use. In the air-cooled field the Bristol "Jupiter" has been given increased horsepower by an increase in the compression ratio and an increase of revolutions. The Armstrong-Siddeley Co. has practically completed the construction of the 700 horsepower "Leopard," which engine represents an expansion of the "Jaguar." In the field of heavy oil engines, there is very little to comment upon. The supposed 600 horsepower engine built by Beardmore developed 400 horsepower and broke its crank case almost immediately after starting its run on the test bench. Single-cylinder experiments have been conducted most of the year by both the royal aircraft establishment and Doctor Ricardo. Knowledge is gradually being acquired, but I am informed that the results are more disappointing than were anticipated, and the development of successful heavy oil engines for aeroplanes is still some distance off.

There has been nothing particularly remarkable in plane development during the past year. Efforts have apparently been directed toward improvement in the type of single-seater fighter equipped with air-cooled engine and in the development of spotting and torpedo planes for naval use. The best types of air-cooled single-seater fighter brought out is generally conceded to the the *Siskin*, which is equipped with a "Jaguar" engine. The best type brought out for naval use is believed to be the Fairey *Flycatcher*. This type, through its wing flaps, has a very low landing speed and is particularly suitable for deck landings.

The British at present are concentrating on air-cooled engine fighters as opposed to water cooled. Their contention is that such a plane on account of its lightness has an excellent climb and is very maneuverable, and that its invulnerability, when compared to water-cooled engine types, is of highest importance. They concede the point that greater speed can be obtained with certain water-cooled types of engines. They are also going in extensively for metal construction. As their specifications prohibit welding, this metal construction is very expensive. They claim that with the knowledge already gained

the price could be brought down to a reasonable level in case of production on such a scale as would warrant the installation of special jigs and other machinery. The general trend in metal construction is more toward steel than toward duralumin and other light alloys.

An effort is now being made toward bringing out experimental two-seater fighters. This type has been rather neglected since the armistice. These experimental two-seater fighters are De Havilland, with Napier "Lion," Vickers "Vixen", with Napier "Lion," and Hawker Engineering Co. "Duiker," with Bristol 400-horsepower "Jupiter." It is rumored that the De Havilland Co. is also developing a two-seater fighter with the "Jaguar," but this seems rather improbable on account of the low horsepower of the "Jaguar." None of these types are yet in service.

Opinions differ as to the best spotting plane. Judged by the activities of the manufacturers, there seem to be more Blackburn *Bulls* ordered than any other one type. The general trend seems to be toward 4-place spotters, although a large number of 3-place spotters are in use.

There is still a great deal of argument as to the merits and demerits of *Amphibians* for spotting use. Most of the old naval pilots advocate the *Amphibian*, while those who have not had much previous water experience prefer the land type on the grounds that it will fly on lower power, hence be more reliable, and that it will put up a better performance in a fight. There are really very few manufacturers in England who know how to build water-type aircraft and this no doubt accounts for the relatively small number of *Amphibians* in use.

The outstanding feature of torpedo plane development during the year has been the realization that the torpedo plane must be at least a two-seater. Opinion in this respect seems to be unanimous. Some planes designed to carry more than one torpedo have been constructed, but these planes are for use from shore bases and have not been subjected to tests.

There has been very little development in large flying boats. The Vickers-Saunders combination built three *Valencia's* which were large flying boats equipped with Rolls-Royce "Condors." These craft were not particularly successful, and it was stated that they were rather difficult to handle. One was completely wrecked on test. The supermarine aviation works built the *Scylla* which has already been thoroughly covered. The *Scylla* is designed to be equipped with Rolls-Royce "Condors," but was tried out first with "Eagles." No definite reports as to its performance have been received, but the impression seems to prevail that it was not a very great success. Efforts are being made toward the development of metal flying boat hulls. One such hull of stainless steel is being

built by the English Electric Co. and one of duralumin by Short Bros.

There has been a considerable amount of activity with regard to carriers during the past year. The *Hermes* has been out for trials, and rather extensive alterations are now being made upon that ship. As a result of these trials and of the experience with the *Argus* very extensive alterations are being made on the *Furious*. The *Eagle* is still under construction. Plans have been announced to the effect that the *Glorious* and *Courageous* will be modified into aircraft carriers as soon as funds are available. It is presumed that these modifications will not be undertaken until after the tests of the *Furious*. The general trend seems to be toward the flush-deck or *Argus* type, as opposed to the island or *Hermes-Eagle* type. The Admiralty opposes the flush-deck type on account of the difficulties of ship control and smoke disposal. In spite of this opposition, however, the *Furious* is undoubtedly being rebuilt with a flush deck.

A considerable number of officers of both the navy and the air force have expressed the opinion that in their belief the United States is committing an error in building carriers of the size of the *Lexington* and *Saratoga*. They state that, as the aircraft carrier tonnage is limited by the Washington treaty, it looks too much like putting too many eggs in one basket. They refer to the notorious inability of aircraft carriers to defend themselves against aircraft, gunfire or torpedo attack, and point out that one bomb on the deck might very reasonably be expected to stop all flying-off or flying-on operations, or both. They further point out that, although strategy in regard to the use of aircraft carriers is not well developed, it appears quite probable that a larger number of small units will be highly desirable. These officers regard the *Furious* type as being of almost ideal size.

Aircraft operations with the fleet during the year have consisted primarily of—

(*a*) Spotting of gunfire;
(*b*) Torpedo attack exercises (principally in port);
(*c*) Bombing exercises;
(*d*) Limited scouting.

The extent to which the aircraft actually controlled the gunfire during this past year's practices has not been definitely ascertained. It is known that weather conditions operated somewhat against the aircraft.

Two torpedo exercises are known to have been conducted against ships of the fleet. These exercises were both successful from the aircraft point of view. One was conducted at night. Bombing exercises were carried out against the *Agamemnon*, miniature bombs being used. No official announcement has been made of the result, but it is unofficially stated that the actual hits were approximately

2 per cent. This exercise was observed by the writer. Conditions were rather unfavorable for aircraft, and the ship was under wireless directional control and made frequent changes of course and speed. The wind velocity was high and the wind was rather gusty. There seems to be a very definite feeling in the navy that the torpedo plane offers greater possibilities in the immediate future than does the bombing plane; in fact the importance of bombing is regarded as more or less secondary.

A limited number of long distance flights were made by the planes of the *F5* squadron. The most important of these flights was one to Sweden, which was made under rather bad weather conditions. One plane was lost, but without loss of personnel.

Very little is heard of the military side of the air force, except as regards the operations in Iraq. The military administration of Iraq by the air force is generally regarded as having been very satisfactory. As a result a considerable amount of favorable publicity has been created, and the slogan "Control without occupation" has been more or less adopted by the air force as representing one of its missions. The usual amount of army cooperation work has been carried on during the various maneuvers, but there are no details of this work available.

Officer personnel may be divided into three general classes:

(*a*) The ordinary regular officers who were formerly included in the Royal Flying Corps and the Royal Naval Air Service.

(*b*) Officers who were taken in during the latter part of the war and since the armistice.

(*c*) Cadets from the training school at Cranwell.

With the exception of a limited number of rather high ranking ex-naval officers who were more or less discarded into the Royal Naval Air Service in the years 1915–16, the general character of the officers included under (*a*) is very good. These officers occupy the principal administrative positions throughout the air force. The officers under (*b*) comprise one of the principal weaknesses of the air force. There was a considerable period after the signing of the armistice when there was a large number of officers and there was also a very small amount of activity and a general feeling of restlessness in the air force due to the uncertainty of the future. During this period a large number of the best officers resigned their commissions. A large number of those who did not resign held on simply because it was the path of least resistance and they were receiving more money than they would ever be capable of earning in civil pursuits. Some of these officers hold permanent commissions; some only temporary commissions. Those who hold temporary commissions will eventually be disposed of, but the others will remain a permanent weakness of the air force.

The cadets of Cranwell, as included in class (*c*), appear to be very good material, although probably not up to the standard of the cadets of the army and navy service schools. Influx of these new officers should, however, raise rather than lower the present standard.

The general standard of enlisted men seems to be very good. These men are obtained from two sources:

(*a*) Direct enlistment and training at depots.

(*b*) Enrollment of boys for a three-year course of training at Cranwell and Halton.

Direct enlistments are open only to men skilled in trades required by the air service. It is understood that a very small number of men are now being obtained from this source. Although there is a vast amount of unemployment in England, this unemployment is among those who are unskilled or who are skilled in such trades as cotton spinning, cutlery manufacture, etc., and are therefore useless as air force mechanics.

The training given the boys during the 3-year course is excellent and the result will undoubtedly be a very high standard among the enlisted personnel of the air force.

There are no lighter-than-air activities in the air force. The stations and equipment are under the director of civil aviation. Small care and maintenance parties are kept at the stations, and the policy is one of marking time in hopes that the Burney airship scheme will go through. The chances of this scheme being approved appear very slight as regards the immediate future on account of the political situation.

The principal civil aviation during the past year has been carried on by the four subsidized companies, namely, Handley Page (Ltd.), Instone, Daimler Airways, and the British Air Navigation Co. (Supermarine Aviation Co.). The increase of passenger-carrying business has been rather disappointing, but the increase in the freight business has been distinctly encouraging. This is especially true of freight to and from central Europe. The entire scheme of civil aviation has been changed by the amalgamation of the four above-named companies into one company called the Imperial Air Transport Co. (Ltd.). The result of the new scheme will be watched with great interest.

GREAT BRITAIN.

TORPEDO PLANE ATTACK ON BATTLESHIPS.

January, 1924.

During the last maneuver with the fleet the air service dropped smoke bombs to windward of the fleet after which the fleet was attacked by a squadron of 18 torpedo planes. The *Queen Elizabeth*, fleet flagship, was concentrated on by two squadron commanders.

She was hit three times. Eleven other capital ships were also hit by torpedoes fired from the planes.

Informant stated that he did not believe that the 14-foot torpedo as carried by the torpedo planes would sink a battleship but would probably give her a bad list. He was confident that the *Queen Elizabeth* would have been sunk.

Informant was formerly a British naval officer and considered the attack on the fleet a wonderful demonstration of the danger to which torpedo planes would subject surface craft in the next war.

GREAT BRITAIN.

TYPES OF PLANES ASSIGNED TO AIR FORCE SQUADRONS.

January, 1924.

The following is a list furnished by the Air Ministry, and stated to include all the squadrons and flights in the Royal Air Force and to show the types of airplanes in use by each.

The following types are at present being (or will be) used by all Royal Air Force squadrons (home and overseas):

No. of squadron.	Type of machine.
1[1]	Snipe.
2	Bristol Fighter.
3[2]	Snipe.
4	Bristol Fighter.
5[1]	do.
6[1]	do.
8[1]	D. H. 9 (a).
9[1 2]	Vimy.
14[1]	Bristol Fighter.
17[2]	Snipe.
20[1]	Bristol Fighter.
24	Composite for communication purposes.
25	Snipe.
27[1]	D. H. 9 (a).
28[1]	Bristol Fighter.
30[1]	D. H. 9 (a).
31[1]	Bristol Fighter.
39	D. H. 9 (a).
45[1]	Vernon.
47[1]	D. H. 9 (a).
55[1]	D. H. 9 (a).
56	Snipe.
58[1 2]	Vimy.
60[1]	D. H. 9 (a).
70[1]	Vernon.
84[1]	D. H. 9 (a).
99[1 2]	Vimy.
100	D. H. 9 (a).
111[2]	Snipe.
207	D. H. 9 (a).
208[1]	Bristol Fighter.
210	Darts.
216[1]	Vimy.
401	Plovers or Flycatchers.
402	do.
403	do.
404	do.
420	Walrus.
421	do.
422	Blackburn.
423	Bison.
440	Seagull.
441	Panther.
442	do.
443	do.
460	Darts.
461	do.
480	Flying boats.
481	Fairey 3. D.

[1] Overseas squadrons.

[2] A flight of Avros is allowed for squadrons in addition to the service type shown until the squadrons are fully equipped

[3] Home defense squadrons not due to form initial flight until Jan. 1, 1924.

GREAT BRITAIN.

VISCOUNT CHELMSFORD, NEW FIRST LORD OF THE ADMIRALTY.

February, 1924.

Lord Chelmsford (Frederic John Napier Thesiger) was created as first Viscount Chelmsford in 1921.

The following information relative to Lord Chelmsford is taken from British "Who's Who, 1924":

Viceroy of India, 1916–1921; barrister; born August 12, 1868; eldest son of second Baron Chelmsford and Adria Fanny, eldest daughter of Major General Heath, Bombay Army; married 1894, Hon. Frances Charlotte Guest, G. B. E., daughter of First Baron Wimborne; one son, four daughters; educated Winchester College, Magdalen College, Oxford; B. A. (first class law); M. A. 1892. Fellow of All Souls College, 1892–1899; Hon. Fellow Magdalen College; member of London school board, 1900–1904; of London county council, 1904–5; alderman, London county council, 1913; Governor of Queensland, 1905–1909; Governor of New South Wales, 1909–1913; a Knight of Justice of St. John, Jerusalem, in England; late Chancellor of the Order of St. Michael and St. George. Church of England. Unionist.

The appointment of Lord Chelmsford as First Lord of the Admiralty is the greatest surprise in the announcements of the Labor Government. His appointment has been the subject of most favorable comment by the Conservative and Liberal, as well as the Labor, representatives, and is most acceptable to the Admiralty and to the navy generally.

Lord Chelmsford has been identified with public service for a great many years, as indicated above. His service, however, has been, since 1905, largely in the British Dominions and India, under various governments, and consequently he has not been identified closely with any political party.

From a reliable source of information it is learned that Lord Chelmsford accepted the appointment at First Lord of the Admiralty only upon distinct understanding that the Labor government would not become involved in "contentious policies."

All available information is to the effect that Lord Chelmsford's natural inclination will be to continue, in general, the naval policies in effect before the Labor government came into power. It is known that immediately upon taking office as First Lord of the Admiralty, he undertook to make himself familiar with the details of those policies, and with the estimates for continuing them in effect. While there have been various rumors as to the adverse effects of the Labor Government upon the naval policies, and particularly those announced by Mr. Amery, as First Lord of the Admiralty, on the last day of the Conservative government, all comment by the well-in-

formed is to the effect that the changes in the policies and in the estimates will only be made after a most thorough examination of both. In fact, the general expression of the British Navy with regard to the effect of the Labor government is that the navy will fare better under the Labor government than it has under recent Coalition and Conservative governments.

JAPAN.

INSPECTION OF YOKOHAMA DOCKYARD.

January, 1924.

This yard was extensively damaged on September 1, 1923, by the earthquake and resulting fire.

Before the earthquake 4,500 men were employed. At present there are 1,500. The authorities propose to engage laborers to the extent of 4,500 but are faced with financial and labor difficulties.

With the exception of the joiner shop, which is rebuilding, the shops necessary to almost normal yard capacity are functioning.

Examination of the building ways and dry docks proved them to be as follows:

No. 1 building ways: The cement foundation was badly cracked; the crane was slightly damaged. Repairs will present no difficulty. A 600-ton commercial refrigerating ship was building on No. 1 ways. The blocks under the ways burned allowing the ship to rest on the cement foundation. The shock of the quake had moved the ship 8 feet in a sidewise direction. The bottom plates of the ship were renewed and by means of hydraulic jacks the ship was blocked up again. Work of construction is in progress.

No. 2 building ways: Same remarks on damage as for No. 1. A 4,000-ton cargo ship for the N. Y. K. Co. was building on No. 2 ways. The effect on the ship was the same as for the refrigerator ship, but in the case of the N. Y. K. ship only the bottom plates had been laid and the job of putting the ship back on her blocks presented no difficulty.

No. 3 building ways: Damage same as for No. 1. On No. 3 ways a 3,000-ton ship for the K. Y. K. has been laid since the earthquake and construction is in progress.

No. 4 building ways: Damage same as for No. 1. A 3,000-ton ship for the K. Y. K. has just been laid on No. 4 ways and construction is in progress.

No. 5 ways: Damage same as for No. 1. The light cruiser *Naka* was building on No. 5 ways. Preparations had been made for launching. The ship was not damaged by the shock of the quake

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but the launching ways caught fire and raged for three days. The forward blocks burned first and the fire gradually crept aft until all blocks were burned. Consequently, the bow being unsupported the ship became badly twisted before it finally rested from bow to stern on the cement foundation. Also the heat of the fire caused the bottom plating to buckle. The ship is now resting on the cement and has a list of about 10°. I was told that she will have to be scrapped, that on account of the extensive buckling, hardly any of the plates can be salvaged, and also that the company is waiting orders from the navy department to begin the scrapping. It appears that the future of the company depends upon the amount of compensation the Government will give for this ship and the question has not been settled.

No. 3 dry dock: The left-hand side (on entering) caved in for almost its entire length. Both ends, including the gate, are all right. The opposite side is cracked but appears to be in fairly good condition. Two small ships were in the dock at the time of the earthquake and were thrown off their blocks. Water leaked in the dock. the ships righted, and were taken out. The dock is now empty except for the débris from the caved in side. I was told that all the docks at this yard were dug out of a hard clay material and that the reason of the damage to No. 3 dock was due to cheap construction. The walls of the dock were of concrete and it was stated that the walls were too thin and could not stand the shock. I noted that the base of the walls of No. 3 dock was about 15 feet wide and that the bases of the stone walls of No. 1 and No. 2 docks were about 25 feet wide. It is planned to rebuild No. 3 dock with a thicker wall.

No. 2 dock was empty at time of earthquake and was undamaged.

No. 1 dock was undamaged. A ship was in dock. It listed about 25° during the earthquake but when the dock was flooded the ship righted herself and was undocked.

JAPAN.

INSPECTION OF YOKOSUKA NAVAL STATION.

January, 1924.

I was received by the commander in chief. He is quite an old man, speaks English very well and is fairly pleasant to talk to but gives one a feeling that he is very secretive—he speaks very guardedly for fear of exposing some military information.

The admiral stated that the present force at the station numbers 10,000 men and that 6,000 men were discharged two months ago.

He said that about 30 per cent of all the buildings at the station were knocked down in the earthquake, but of that number most were old buildings. I asked if the working capacity of the station was greatly reduced and he replied that since the majority of the machinery in shops which went down was not badly damaged the capacity of the station was not much effected. He said that the navy is asking for about Y63,000,000 for the restoration of the station and that the work will require about seven years. I suppose he meant that the appropriation would be spread over a period of seven years. I inquired if any changes were contemplated in the restoration and was told that the plan is to build the station as it was before. The admiral stated that the oil tanks were being built on their former site and to their previous capacity.

I was then escorted through the station by a commander in the construction corps. He was in America for sometime in connection with the building of the oil tanker *Kamoi*. Contrary to the rule, he is a very broad-minded Japanese naval officer and quite willing to discuss naval questions.

The dry docks and building ways are undamaged. Two submarines, *No. 14* and *No. 15*, were in dock at the time of the earthquake and were slightly damaged. Temporary roofs have been placed over most of the old shops which fell.

The commander first took me to the building ways on which the *Amagi* was building. He said, as reported before, that the blocks under the *Amagi* sank to such an extent that the keel is badly bent. I could not see that the ship had been damaged, but I could see large cracks in the cement foundation under the *Amagi* and I could also see that investigations had been in progress on the underside of the ship, for a number of the blocks under the ship had been renewed. Workmen were there engaged in scrapping the *Amagi* on the ways. The commander said that when the *Amagi* is scrapped and the berth repaired, that the keel of the 10,000 ton cruiser *Myoko* will be laid on those ways. He said it was expected to lay down the *Myoko* next fall.

In going through the station we passed a dry-dock in which the *Hakaze* was being repaired. I remarked that there were no mine tracks on this ship and my escort stated that only the latest destroyers carried mines or were fitted with director firing equipment.

We then passed another dock in which submarines *Nos. 27, 28, 29,* and *46* were undergoing repairs. I roughly spaced off the length of these boats to be about 210 feet for all except *No. 46*, which is about 240 feet. My escort said that all these boats were the L-type.

I said what do you mean by L-type and he replied that in the Japanese Navy there were three types of submarines, viz, the navy type which is a copy from the German boat, the Fiatt type, and the L-type which is a name given to the Vickers and also the Labuf type boats. I compared the boats in dock very closely and could not notice any difference in appearance except that *No. 46* was slightly larger, has a larger bridge, and has the 8 centimeter antiaircraft gun mounted on the forward part of the bridge. The wireless masts of these boats are telescopic; each mast has three sections of about 10 foot lengths. The antenna is a three-wire spread. These boats have four bow and two beam tubes, are fitted with oscillators, K-tubes, bow planes and periscopes of German design. The torpedo tubes are 18 inches.

The battleship *Kaga* was moored in the fitting basin, having recently been put in dry dock for painting. The commander said that there would be no difficulty about converting her to an airplane carrier within the prescribed tonnage limit. He said that all the present upper deck housing would be cleared off and that another deck would be installed above the present top deck. The date of completion is indefinite.

The battleship *Nagato* was in dry dock. I passed close aboard her. An effort was made to estimate her gun elevations but the guns were all level and no estimation could be made. It was noticed, however, that the gun ports in the face of the turret extended to about 1½ to 2 inches from the top of the face of the turret. The *Nagato* has one 10-meter range finder in her foretop. She has twin rudders which my escort said were also put on the *Kongo* class. The *Nagato* has been out of dock about nine months and had acquired a very heavy marine growth. Escort stated that it was the policy to dock ships every 10 months for painting and that after cleaning the side and bottom, two coats of a German anticorrosive paint called Raghten was applied, after which one coat of the same brand of antifouling paint was put on. He said that two coats of antifouling paint were applied at the waterline. Informant stated that the pigment of this brand of paint was copper instead of the lead pigment used on the bottom of United States naval vessels.

I saw two first-class destroyers which, I believe, were *No. 3* and *No. 5*. They had mine tracks aft. I saw *No. 1* mine sweeper which looked very much like a second-class destroyer. She has mine tracks aft, several destroyer type guns, and paravanes carried in each quarter.

I passed close aboard submarine *No. 58;* she is practically completed. Her steering-gear motor was destroyed in the Tokyo fire

and she is waiting for a substitute motor. The *No. 58* is a navy type and a sister of *No. 62*. The *No. 58* has four bow tubes and two other underwater tubes forward, one on each side and just aft of the forward diving rudders. The bridge superstructure is very much like the German type. There is no gun yet installed, but there appeared to be no place on the bridge for a gun. No deck gun foundation was seen. Submarine *No. 57* looks very much like *No. 58*, but is possibly a little larger. Informant said *No. 58* is fitted with two 1,250 horsepower engines, has a speed of 18/10, and an economical radius of 5,000 miles.

In the course of conversation informant gave me the following information:

1. The *Haruna* will be the first ship to be repaired in the capital ship alteration program. The plans for alteration to capital ships do not include increase in elevation or underwater blisters. Increased deck armor will be put on. He said that the question of putting on blisters involved the matter of the width of dry docks and building ways and would not be adopted. In place of blisters (in the case of future construction) he said that torpedo bulkheads similar to those of the *Nagato* and *Mutsu* would be adopted.

2. Informant stated that the maximum elevation of the *Mutsu* and *Nagato* is 25° and that of the other first-class battleships and battle cruisers is 23°. He said this angle would not be increased. (NOTE.—These statements were made candidly and with apparent frankness in explaining to me why the alteration program did not include provision for increase of gun elevations or for blisters, but they must be accepted with some reserve.)

3. No mine laying submarines have been built, but some will be built.

4. The torpedo and gunnery school at Yokosuka is undamaged.

5. No mines are manufactured at Yokosuka, but some torpedoes are made there.

6. Informant stated that the radio power plant of a submarine is from 1 to 1½ kilowatts and that the radius of the plant is 100 miles in daytime.

7. The power of the *Nagato's* radio is 5 kilowatts and also 25 kilowatts, using undamped wave.

8. One more submarine, *No I–58*, has been ordered built at Yokosuka, but the work of laying can hardly be started this year on account of the scrapping of the *Amagi*, the repairing of the *Amagi's* present berth, and the laying of the *Myoko*. The *I–58* is to be about 1,300 tons surface displacement.

JAPAN.

KURE NAVAL STATION.

January, 1924.

The commander in chief is Admiral Suzuki; a jovial, pleasant and friendly man well liked by his subordinates; he does not speak English, but understands it fairly well. He has visited the west coast of the United States.

The principle object of the visit was to investigate the situation as regards submarines built and building and to see the submarine school.

After inspecting the submarine school a luncheon was given by Admiral Suzuki and in the afternoon an inspection of the naval station was made. The principle activities of the year were the scrapping of ships and minor repair work of ships attached to the station.

Captain Murase, I. J. N., who brought the tanker *Kamoi* from the United States to Japan, escorted us through the naval station. He is a very affable man who smiles or laughs on the slightest provocation or excuse. He appeared perfectly willing to answer questions and to give information on the work in progress, but he seemed to know very little about the industrial questions of the yard and arsenal through which he acted as escort. If it was designed that the escort should not give any information then I commend Captain Murase for that job. He apparently knew no more about the yard than a new comer though he had been attached to it for about eight months. The probability is that it was not the design of the authorities to deny information, but rather that Captain Murase was so overcautious not to give away any military secrets that he feigned ignorance on nearly everything asked him and passed it off with a wide but good-natured grin.

In the arsenal were seen about 25 or 30 large guns which were said to be 16 inches and which had been built for the 8–8 program.

While riding through the yard Captain Murase pointed out the submarine *No. 51* which was building about one-half mile away. She appeared to be very much like *No. 72*, but seemed a little larger. The tonnage of the *No. 51* was stated to be 1,500 surface. Shortly afterwards submarine *No. 44* was pointed out. The boat was in a dry-dock about one-quarter of a mile away and all that could be seen was the top of her conning tower. Many inquiries were made about this boat and no evidence could be obtained to show that *No. 44* is larger than 740 tons surface displacement. We were not allowed to get a more close-up view of these boats.

The wireless station of Kure is of very low power. The antennae is supported by two spar masts at one end of the drill ground near the administration building. It was said to be 30 kilowatts.

With the exception of the submarine information mentioned above no other information which has not been previously reported was obtained at Kure.

While on the train returning from Kure, Commander Kubo, commanding officer of submarine tender *Karasaki*, stated that the accident to submarine *No. 26* was purely due to ignorance or carelessness on the part of the crew who opened the wrong valve. In speaking of Hiroshinta, a city near Kure, Commander Kubo stated that it formed an admirable base for the embarking or landing of troops and supplies.

JAPAN.

MAJOR CALIBER PROJECTILES.

January, 1924.

The following is some unconfirmed data concerning Japanese 14-inch A. P. projectiles.

Fired at 12-inch Vickers "C" plate armor: 14-inch A. P. projectiles, 30° attack (oblique):

Striking velocity	[1] 1,710
DeMarre	1.37
Energy	28,000
Striking velocity	[2] 1,787
DeMarre	1.43
Energy	30,600
Striking velocity	[3] 1,761
DeMarre	1.41
Energy	29.750

The above data relates to 14-inch A. P. projectiles manufactured by Hadfields for the Japanese Navy. They are believed to be the reports of the projectiles fired in Japan.

JAPAN.

NAVAL NOTES.

January–February, 1924.

(From Japanese press.)

The *Yubari*, of the third division, is to undergo an official trial for avoiding attack by mechanical mine. The arrangement is a defensive equipment against various mechanical mines and is not anything like a torpedo net, but is an arrangement to get rid of mines by means of high-speed sweeper. Cruisers recently built carry such an equipment.

NOTE.—This is probably a paravane equipment such as is being fitted on latest destroyers.

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[1] Broken up; did not penetrate.
[2] Penetrated; went through plate unbroken.
[3] Went through plate unbroken.

YUBARI.

As a result of the finding of the board of inquiry as to the cause of the sinking of the submarine *No. 26*, the flotilla commander, the commanding officer of the submarine, and about 10 others were ordered to a strict confinement to home for three months, the finding of the board being that the accident was due to faulty handling of the submarine. They will be brought before a court-martial board to be held at Kure at a later date, charged with "sinking of a vessel due to negligence."

The light cruiser *Kinu*, which was taken off the new organization of the standing fleet, went into dock at Kure December 20. Four turbines, two forward and two aft were removed. The taking apart of the turbines has started and the repairs will be completed in May, 1924.

The navy department is conscious of the fact that the mechanical efficiency of light cruisers is much inferior, as compared with other classes of ships, and have been studying the question. The *Kinu* is an exception in that her engines are very poorly constructed and of poor material.

The *Kinu* was launched in 1922 and was assigned to the combined fleet in the fiscal year of 1922, and is in the above condition after serving about a year. The *Oi* also has had trouble with her engines, and was built by the same company, Kawasaki Dockyard, of Kobe, against which much adverse criticism is being directed.

Orders for the construction of the light cruiser *Nachi* was given the Kure naval station December 19, 1923. She will be 10,000 tons displacement and have eight 8-inch guns. Keel will be laid in April, 1924.

It is expected that Yokosuka naval station will build her sister ship, the *Myoko*, about the same time.

When Captain Kamimura (brother-in-law of Minister of Marine Takarabe) and Commander Yamamoto (son of Premier Yamamoto) were placed on the waiting list December 1, 1923, the public took it as a sign that the Minister of Marine did not consider personal relations when it came to a matter of official necessity.

It has since come to light that Commander Yamamoto was placed on the waiting list at his own request, while Captain Kamimura was placed on the waiting list on account of negligence.

Captain Kamimura was in command of the *Katsuriki* at the time of the earthquake, and his ship was ordered to carry provisions and supplies from some port in Shikoku Island. The *Katsuriki* left Kure September 8, 1923, and approached the offing of Takahama the following day about 2 a. m. and mistaking Kashima for Yokoshima

Islands went aground on Miyanohama Reef, and for a time was in serious danger. At the time the captain was in his cabin sleeping, the navigator having taken charge. To lighten the ship several hundred tons of coal were thrown overboard, and, with the rising tide, succeeded in floating the ship and managed to reach Shinagawa. The accident caused big rents to the drinking-water tank, powder room, and No. 1 mechanical mine room, but due to the excitement following the catastrophe the news did not become public.

The accident was the fault of the navigator, who had relieved the captain, but as the commanding officer of the ship, Captain Kamimura could not escape responsibility, so was placed on the waiting list. The navigator, Lieutenant Nagao, is under confinement, pending further action.

NOTE.—No information as to the extent of the damage has been obtained.

The ice breaker, *Odomari*, which went aground off the coast of Hokkaido, has been salvaged. The extent of damage is not known.

Pigeons are to be used in the Japanese Navy to carry messages. For some time past experiment with pigeons has been going on, on board the *Takasaki* and *Wakamiya*. This means of communication has been found quite successful, and it has been decided to adopt it in the navy, to be used in giving orders and for communication between ships while in fleet action.

This is the first time this means of communication has been applied in the Japanese Navy.

Two more *F–5* hydroplanes will be delivered to Sasebo from Nagoya, and Yokosuka will receive 12 some time between the latter part of January and March, 1924.

The Sasebo corps, after the arrival of the two *F–5* hydroplanes, will undertake a flight to Taiwan.

Submarine *No. 62*, attached to the fourteenth submarine division, left Sasebo December 29, 1923, for Kure. She ran into high seas in Genkai-nada, and while trying to make a submerged cruise, despite the rough sea, an accident occurred to her engine and she was forced to return to Sasebo.

Submarine *No. 62* was only recently constructed at Sasebo, and did very well in different official trials. It was intended to put her with *No. 45* and *No. 58* and to make up a flotilla.

NOTE.—It is believed *Nos. 45, 58,* and *62* are sister ships of about 775 tons surface displacement. They are navy type boats with six underwater tubes forward.

The commanders of the three destroyers, *Kaki*, *Toga*, and *Kuri*, belonging to the twenty-sixth destroyer division of the Sasebo naval station, have been punished by detention.

The three destroyers collided in the Shimonoseki Straits in getting out of the way of a British warship.

NOTE.—The extent of the damage has not been learned but it is not believed to have been serious.

JAPAN.

PRESS ARTICLE ON YOKOHAMA DISASTER.

October, 1923.

The following article was prepared by the author for release to the press but upon the recommendation of this office was not published. It is given here only for the purpose of reflecting the opinion of a certain section of our civilian population and press. This office does not necessarily indorse any of the facts and opinions stated:

YOKOHAMA DISASTER REVEALED JAPAN'S MISTAKEN FEAR OF THE UNITED STATES.

IRRECONCILABLE POLICIES MAKE IT ENDURING—JAPAN CONTINUES HER NAVAL EXPANSION.

(Special correspondence to the New York Tribune.)

SHANGHAI, October 6.—Obstacles thrown in the path of foreign observers by Japanese officials and the present rigidity of the perennial Japanese censorship of the cables have prevented the shocking attitude of Japanese officials toward the United States naval relief activities and other aspects of the Yokohama disaster from becoming known and transmitted to the American public at an earlier date. Hence specially informed sources were developed and special channels were used to bring out of Japan the following matter which should be of enduring import to the American public.

At the time of the disaster the Japanese police, army, and navy forces became utterly demoralized and failed to reestablish any semblance of order for about a week. While refugees speak in the highest terms of many instances of loyalty and devotion on the part of their Japanese servants, the criminal and near-criminal classes of Japanese in Tokyo, and more especially in the port of Yokohama, inaugurated an orgy of looting.

It so happened that just before the disaster the Japanese Government was seeking a foreign objective upon which to focus Japanese popular attention in order to thwart the insurgent plans that radicals were developing in the industrial centers. Consequently the Government seized the opportunity presented by the disaster to proclaim that the looting was being done by Koreans, who were also charged with having started many of the fires that had been kindled actually by upset stoves and electric wires in the collapsed wood and paper houses.

Koreans were herded up and Japanese soldiers shot them down with machine guns in at least one specifically reported instance. The current belief is that orders were to the effect that Koreans were to be killed at sight; and about 1,500 are said by the Japanese to have been slaughtered, thus giving to the Japanese populace a manifestation of the presumptive guilt of the Koreans. And it is of enduring significance that all classes of Japanese rallied loyally to this action of their Government although, among themselves, they were outspoken over the temporary demoralization of the police and military forces for which they are so heavily taxed.

In passing, it is worthy of note that the British, American, Dutch, French, and Italian merchant ships in the harbor of Yokohama at the time of the disaster remained in port and, in the order named, did valiant rescue work, receiving all refugees alike and in accordance with the doctrine of the real sailorman of our civilization that is implied by the phrase: "Women and children first." Only one British ship promptly weighed anchor and made for the open sea without waiting to do rescue work; and only the German-born mate of an American ship failed to rise to the emergency—a failure that was promptly corrected by the officers of the Canadian Pacific's *Empress of Australia*, who saved over 2,000 people. But the Japanese tugs that might have rendered invaluable aid failed to do so; and most of the Japanese steam merchantmen in port rushed outside the harbor without lingering to do any rescue work. Evidently the Japanese seamen considered the immediate removal of their ships and themselves from the danger zone more important than the saving of the lives of a great number of their own compatriots and others.

A more shocking manifestation of the totally different point of view of the Japanese was shown by their attitude toward the relief work carried out by the United States Navy—which relief work our British cousins of the sea have been first to proclaim as transcending that done by any other naval contingent.

In connection with it an American Red Cross unit was rushed to Yokohama, a temporary hospital was set up on the shore, and its American doctors and nurses opened it for the relief of all comers. But the Japanese officials at first refused to allow it to be operated unless the American doctors withdrew and Japanese doctors were put in charge. And this though already there was vastly more work in Tokyo and Yokohama than the Japanese doctors could attend to. A firm American stand resulted in the hospital being operated by its American staff—in spite of the peculiarities of Japanese psychology.

The above outlined lapses from what we would call civilized standards sink into relative insignificance, however, when we consider the reception and treatment accorded our naval relief contingent—and the Japanese reasoning that produced this treatment.

At the time of the earthquake the Asiatic Fleet of the United States Navy was in Dairen, a port in Chinese Manchuria under Japanese control. Immediately upon receipt of a wireless outline of the disaster, Admiral Anderson dispatched a destroyer at top speed in advance of a division of destroyers at high speed and followed in his flagship, a 19-year-old second-class cruiser, with the rest of the fleet. That the entire fleet did not proceed at top speed was due, presumably, to the rigid limitation of fuel now imposed on our Navy by Congress.

When our first destroyer arrived off Yokohama, the Japanese naval authorities peremptorily refused to allow her to enter the harbor. To this her commander replied that his commander in chief had ordered him into Yokohama harbor to aid in rescuing Americans and others. The Japanese persisted in denying him permission to enter, whereupon he carried out his orders and made repeated trips rescuing hundreds of people.

Meanwhile the division of destroyers and the remainder of the fleet with Admiral Anderson arrived, anchoring near the entrance of the breakwater in Yokohama Harbor, and began sending their boats in on relief work. Soon after the arrival of our fleet, the heaviest guns of which were 8 inch, several of the Japanese battleships with 16-inch and 14-inch guns took position between our fleet and the exit from Yokohama Bay at the Narrows. Then a division of Japanese cruisers came up the bay, circled our fleet and assured itself that we seemed to be engaged in bona fide relief work and thereupon rejoined the Japanese capital fleet down the bay, taking no part in the relief work. The mission of the Japanese Navy properly is to be instantly ready at all times to defend Japan and to support her policies. Its abstention from relief work, under the circumstances existing at that time, forces one to the conclusion that it then considered instant readiness for action of paramount importance.

Then came the crowning slight—not to say insult—to the American naval relief contingent, and through it to the American people, who at that very moment were pouring out their gold for the relief of the stricken Japanese.

The report current here in what are usually designated as "officially informed circles" is that the Japanese "sealed" the wireless on Admiral Anderson's flagship, thus preventing him from communicating directly with his Government. In such circles it is pointed out that the Japanese Government was entirely justified in enforcing a rigid censorship on all unofficial communications, for only thereby could the dissemination of irresponsible and exaggerated stories be minimized. But it is pointed out with equal emphasis that the Japanese transcended proper bounds in seeking to prevent an American admiral on his flagship from communicating with his Government, presumably on the matters of relief upon which he was engaged.

We repeat that the report is that the Japanese "sealed" Admiral Anderson's wireless. To have done this physically would have necessitated their boarding his ship and tampering with his wireless equipment. It may be that under the very tense conditions that existed—which are set forth below—Admiral Anderson thought it the part of wisdom to yield to such a violation of the sanctity of an American public vessel. But it is pointed out that the Japanese may have confined themselves to ordering—or "requesting"—Admiral Anderson not to use his wireless; and that by such a procedure they would have attained the end they sought.

Be that as it may, it is known positively that Admiral Anderson was prevented by them from using his wireless and, consequently, was obliged to detach one of his destroyers from relief work proper and detail her to communications, sending her periodically with his dispatches down Yokohama Bay and outside the 3-mile limit so that she would be free on the high seas to radio his dispatches.

That such actions by the Japanese as have been described above were the result of panic on their part would seem obvious. But what cause was there for panic on their part at the appearance of the American fleet on an errand of mercy? The explanation that has come gradually to light has its roots deep in the policies of the United States and of Japan and in the totally different mental points of view and standards of the two Governments and peoples.

Some people wonder why Japan—in spite of the diplomatic amenities with which her official spokesmen constantly favor us—persists in acting as though she suspected and feared the United States. The root of this is in her policy and in our policy toward Asia.

The substance of the American open-door doctrine is that there there should be equality of commercial opportunity for all without territorial sequestration or interference in government. The record of Japanese practice up to the moment is that commercial opportunity should be made virtually exclusive for the Japanese in an ever-expanding sphere by territorial sequestration (as in the case of Korea) and by interference in government (as in the case of the 21 demands on China). The American policy and the Japanese policy are and must remain irreconcilable. Consequently Japan, knowing her own plans and purposes toward Asia, fears the United States as the principal opponent to her execution of them.

Realizing what means she will have to take to attain her ends—unless the United States should abandon the effort to uphold righteousness in Asia—Japan first guards herself by one of the best systems of coastal defenses in the world; and on top of that she persists, even now, in developing her naval fleet for offensive work—as we shall see hereunder.

When the late war in Europe broke out, she seized Shantung Province and sought to impose on China her notorious 21 demands—which latter would have turned this happy country into a vasal state of Japan—to the exclusion of substantially all white influence and trade. The Japanese Premier officially characterized the circumstances that made such a move possible as "the opportunity of a century" for Japan to carry out her aims on China.

When the recent earthquake shattered Japanese public morale, destroyed the fortifications of Yokohama Bay and Tokyo, paralyzed Japan's great naval base at Yokosuka, and momentarily chained her almost undamaged fleet to the shore by destroying its oil reserves, then Japanese officials saw instantly that Japan was relatively defenseless for the moment. They reasoned that others would act under these circumstances as they themselves had acted and, presumably, would act under similar circumstances. To their way of thinking it was obviously "the opportunity of a century" for the United States and her irreconcilable policy to impose her will on Japan. The calamity that had overtaken them caused impulsive actions which revealed the thoughts natural to them and made unavoidable the conclusion that they expected the United States would act toward Japan as Japan herself had acted toward China less than 10 years ago.

It was a lucid, though shocking, demonstration of the estimate Japan really held of us because of her knowledge of her own character, motives, and purposes; for by her judgment of us she made manifest her real judgment of herself.

We have to reorient some of our basic conceptions in order to realize that Japanese officials actually thought that we would send our puny Asiatic Fleet into Yokohama Harbor under the pretext of doing relief work, then create an "incident" as a cause for war, let the Japanese destroy a few auxiliaries that constitute our Asiatic Fleet, and then rush our main fleet across the Pacific to sink their tethered battleships and to impose our will and policy upon Japan. Truly it was "the opportunity of a century"; and had our Navy actually been up to the naval treaty ratio in every essential respect we could have done it—were it not that we have principles essentially different from those of the Japanese.

Such are the circumstances that have gradually come to light and have explained why the Japanese tried to prevent our naval vessels from entering Yokohama Harbor, why their cruisers inspected our relief operations while their battleships held our inferior vessels under their long-range guns, and why the Japanese sought to prevent our admiral from maintaining direct communication with our Government.

Of course, our actual conduct proved to them that they were totally mistaken in their estimate of what we would do. Whether they think us fools for not having acted as they would have, can not be said. But their actions, when a calamity laid bare their real character and consequent estimates, should be of enduring interest to the American people.

Perhaps the most discouraging phase of this shocking affair is the Japanese plan not only for reconstruction but for increased naval construction *after* our deeds have proved our kindly character and now that Japanese finances are strained and should be turned to civilian reconstruction.

Immediately after the Yokohama disaster the Japanese were loud in their protests that their naval power remained virtually unimpaired. They reasoned that we might be bluffed out of making the attack they believed we contemplated. But now that we evidently are so stupid as not to have recognized "the opportunity of a century" when it presented itself, they are attributing all sorts of naval losses to the Yokohama disaster.

Their principal naval losses actually are as follows:

The only valuable fighting ship that they lost from their fleet in being was the *Naka*, a new cruiser. The *Akagi*, one of the great aircraft carriers they are building in accordance with the Washington naval treaty, is believed to have been seriously damaged. Their great naval base at Yokosuka, quite contrary from having been totally destroyed, is so little damaged that they have appropriated only $4,000,000 to put it in shape preparatory to starting to build some more big cruisers there—of which more anon. And the repairing of the remainder of the damage to their naval establishment ashore has called for an appropriation of only $1,500,000. Apart from the injuries to the *Naka* and the *Akagi*, all this can be put right within six to eight months—whereupon Japan's second postconference building program will go forward without further delay.

To realize the scope of this program and to sense the peculiar point of view that has given it birth, one must recall that one aim of the Washington Conference was to end competition in naval building programs and stop consequent increases in the mounting burden of naval armament. But, while the conference limited the size of capital ship fleets and of aircraft carrier fleets, it left all powers entirely free to build as large fleets of other surface combatant auxiliaries and of submarines as they might choose.

By the Washington Conference Japan was saved the cost of having to finish two battleships of about 40,000 tons each, or something under $80,000,000. That was her total saving in cost of construction under way. Within six months after the conference, she decided on the building of four new 10,000-ton cruisers and of four new 7,500-ton cruisers, all permissible under the letter of the naval treaty. The building of this 70,000 tons of postconference cruisers is costing her over $70,000,000. At the same time she decided to add 25 long radius submarines to the three she already had. (The United States has three such submarines afloat and had started the building of three more before the conference.) These 25 postconference submarine of Japan's are costing her over $56,000,000. So the total cost of her first postconference building program, for only cruisers and long radius submarines, amounts to over $126,000,000. And if from this we deduct something under $80,000,000 as saved on the two battleships above mentioned, still there remains over $46,000,000 as the net increased burden of naval construction cost that Japan undertook in 1922 by her first postconference building program.

Not content with that, just before the Yokohama disaster the Japanese Government decided on its second post-conference building program. This includes 10 more 10,000-ton cruisers, which will cost over $100,000,000, and over

50 more long-radius submarines, which will cost over $120,000,000, making the total cost for the cruisers and big submarines of Japan's second post-conference program over $220,000,000. And if to this we add merely the net cost of her first post-conference program for only cruisers and big submarines, we find her committed to spend over $266,000,000 net in new construction on these items alone since the Washington Conference. Yet the comparatively rich United States has not authorized one new naval vessel since the conference.

It would be natural to expect that, after the calamity at Yokohama, the prosecution of Japan's colossal plans for naval expansion would be suspended. But not at all. Two weeks after the Yokohama disaster the building of one of the ten 10,000-ton cruisers of the second post-conference program, decided on only this last summer, was begun at Kobe. The repairs to the great naval base at Yokosuka are being pushed so that at least one more of this same lot of cruisers can be started there before next spring. And it is said that the construction of some of the newest lot of submarines will be undertaken without delay.

Premier Yamamoto is reported to have just said:

"With the Washington agreement available only for a limited period, and with growing possibilities of clashes of interests among the powers in general, it is advisable for Japan to direct her efforts of reconstruction in such a manner as to consolidate the national foundation."

That was a more diplomatic statement than Premier Okuma's to the effect that the European War had given to Japan "the opportunity of a century" to work her will on China. But the current conduct of Japan shows that Admiral Premier Yamamoto has in mind and means to give preference to continuing with a minimum of delay the tremendous expansion of the Japanese Navy that was planned just before the Yokohama disaster. And to continue this naval expansion even though the conduct of the United States naval relief contingent at Yokohama proved to the Japanese their mistake in expecting the United States then to seize "the opportunity of a century" to attack Japan; and even though the American public, always sympathetic to the stricken, has poured millions of dollars into Japanese relief funds.

Why does Japan persist? Because her Government knows that the American open-door doctrine of equal economic opportunity for all without territorial sequestration and without interference in Government must remain irreconcilable to the Japanese Government's policy of exclusive opportunity for the Japanese in an ever-increasing sphere by territorial sequestration and interference in Asiatic governments.

Will the American people abandon to Japan Asia where over a fifth of our more and more important trade is? Or will the American people face the facts and recognize the implications revealed by contemporaneous Japanese conduct? Will the American people take such steps as to convince Japan that they will persist in insisting on the righteous policy of equality of opportunity for all—including Japan—and of national integrity?

If our deals are to be more than the vapors of good intentions, evidently we must express them in such substantial forms as will carry conviction to the medieval Japanese mind and dissuade it from its feudal policy and practices.

JAPAN.

SASEBO NAVAL STATION.

January, 1924.

We were conducted through the station by an aid to the admiral and representatives of the engineering and construction branches. There seemed to be a cordial degree of frankness in answering questions regarding the station.

We were shown all the submarines at the station, but were told that there was no such thing as a submarine base.

The ships building at Sasebo are destroyer *No. 17*, mine sweeper *No. 4*, and submarine *No. 62*. The submarine is launched; the other ships are still on the ways. The other activities of the yard are the scrapping of ships and the minor repairs to vessels attached to the station.

The wireless station is a distant-control arrangement. The receiving station is near the administration building and the sending station (controlled from Sasebo) is located on Hario Island about 7 miles from Sasebo. The sending station is rated at 100 kilowatts, continuous spark, undamped wave, and range of about 1,500 miles.

Admiral Saito is in command at Sasebo. He is a very genial and pleasant man. Speaks English fairly well, and seems to be friendly toward Americans. He commanded the training squadron which visited New York in the fall of 1921. He says of the Singapore scheme that it is within England's treaty rights, and lets it go at that. Several other high ranking officers have spoken in the same vein about Singapore. They do not like it, and feel it is contrary to the spirit of the treaty.

At Sasebo there is a small aviation station where they have about 20 seaplanes. I was not shown this air station, but it was pointed out, and is situated on the right hand entrance of the harbor.

This station has limited facilities for manufacturing torpedoes, mines, and seaplanes.

One 600-horsepower Diesel engine of Busch-Sulzer design is being built at Sasebo.

The light cruiser *Yura*, which was seen at Sasebo, has an airplane platform secured to the conning tower and extending slightly out over the turret. When a plane is secured in place officers on the bridge can just see over it. It was stated that the plane was secured by pelican hooks until the engine was up the proper speed. The hooks were then released and the plane took off over the bow. The run for the plane did not appear to be more than 30 feet. The *Yura* has mine tracks laid on deck aft.

A good view was obtained of the light cruiser *Yubari*. She is a very odd looking craft, the only one of her type, and built as an experiment. Endeavor to find out what was the nature of the experiment was unsuccessful, but it appears most probable that mine laying is the chief use for which the craft was built and that her very irregular, crazy looking design is for the purpose of making range finding very difficult for an enemy. The deck lines are not straight, the masts are canted at angles, the forward one has a decided rake aft and the after one a slight inclination forward. The bridge is very low and the stacks are combined in an odd way into one. The forward stack curves aft into the middle stack and the after one curves forward into the middle stack. The deck is cut away at the stern and two mine tracks lead aft on each side of the lower deck. The mines are discharged through doorways at the stern.

While at Sasebo a conversation was held with one of the aides. He is a lieutenant and stated his specialty is ordnance. He did not appear to be particularly bright, but he seemed to be well informed on navy matters in general. He spoke with a conviction of knowledge, but it was impossible to tell whether his statements were truthful or whether they were prevarications manufactured as a clever ruse. I frankly do not know how much credence to give this information. Herewith are some of the statements made by him:

(1) The maximum elevation of the *Nagato* and the *Mutsu* is 20 degrees for a range of 20,000 meters.

(2) The maximum elevation of other capital ships is 15 degrees.

(3) The target used for battleships and battle cruisers is towed at 10 to 12 knots, and that the maximum target range is 20,000 meters.

(4) The latest destroyers are fitted to carry paravanes aft.

(5) The latest first-class destroyers and light cruisers are fitted with tracks on the after deck for carrying mines. These tracks, one on each quarter, are each capable of carrying about 8 or 10 mines.

(6) There are five types of Japanese mines.

(7) The peace-time torpedo allowance for all ships carrying torpedoes is one spare for each tube. In case of war more torpedoes would be carried, but there is no provision aboard for more than the peace-time allowance.

(8) Gunnery officers study at the gunnery school for one year, after which they go to sea as gunnery officers; first on destroyers, then to light cruisers, and finally, if they have a good record, they graduate into the big ships for gunnery duty.

(9) Japanese naval officers in general have a specialty in which they receive particular training. If they do not elect their own specialty they are selected. The specialties are gunnery and torpe-

does, mines, navigation, and aviation. Submarine duty is included in gunnery and torpedo. Engineering is separate.

(10) Range of destroyer torpedoes is 10,000 meters.

(11) The submarine carries an 18-inch torpedo of 6,000 meters range. (NOTE.—Captain Omoto, vice president of the submarine school, also told me the submarine torpedo is 18 inches, with a range of 6,000 meters and a speed of 38 knots for the first 400 yards.)

(12) The materials used in the Japanese Navy for turbine blading are monel metal and stainless steel.

JAPAN.

SCHEDULE OF EMPLOYMENT FOR FLEET.

January, 1924.

Herewith is an official announcement showing the employment of Japanese fleet:

Date.	First fleet.	Second fleet.	Employment.
December, 1923:			
First part	Home ports	Home ports	Independent training.
Middle part	do	do	Do.
Latter part	do	do	Preparations for cruise.
January, 1924:			
First part	do	do	Do.
Middle part	do	do	Do.
Latter part	Western part of Inland Sea.	Western part of Inland Sea.	Assembling of combined fleet.
February, 1924:			
First part	do	do	Training in torpedoes, gun-firing, mine-sweeping and communication.
Middle part	do	do	Do.
Latter part	do	do	Do.
March, 1924:			
First part	do	do	Do.
Middle part	Cruise western part of Yellow Sea, Taiwan and Southwestern Islands.	do	Do.
Latter part	do	Cruise Chosen and Manchurian coast.	Do.
April, 1924:			
First part	do	do	Do.
Middle part	Western part of Inland Sea.	do	Do.
Latter part	Ise-wan and vicinity	Cost of Honshu	Do.
May, 1924:			
First part	Home ports	Home ports	Exchange crews, docking, etc.
Middle part	do	do	Do.
Latter part	do	do	Do.
June, 1924:			
First part	Vicinity of Chinkai	South coast of Kyushu, Southwestern Islands.	Training in gun firing, torpedo firing, communications.
Middle part	do	do	Do.
Latter part	Vicinity of Sasebo	do	Do.

JAPAN.

SOME COMMENTS UPON THE PRESENT CABINET.

January, 1924.

The Japanese political situation is most unsatisfactory to all concerned and for months there has been extreme political unrest. The Yamamoto cabinet augured to usher in a pacifying adminis-

tration, but it turned out to be an emergency cabinet formed on the day of the earthquake and consisting of the brightest luminaries in the Japanese political, financial, and educational circles. Events proved that there were too many stars on the team and the dissension within the cabinet on questions of suffrage, reconstruction, and Government aid to insurance companies resulted in a decidedly weak and vacillating administration during a time of great emergency and suffering. This made the short life of the cabinet a certainty and when the attempt was made to assassinate the Prince Regent the wobbling cabinet accepted the responsibility as theirs, and therefore resigned, thus letting go of the bear's tail as gracefully as possible.

The Yamamoto cabinet boasted of its being an independent nonparty cabinet and it was probably this boast as much as anything else that caused it to fail, for it lacked the support of any party and aroused the antagonism of all parties.

Upon the resignation of the Yamamoto cabinet following the attempted assassination of the Prince Regent, Viscount Kiyoura, president of the Privy Council since 1922, was chosen to form a new cabinet. He formally declined to accept this responsibility, but upon insistence by the Prince Regent he agreed to head the Government and proceeded to select the cabinet personnel.

The selections for the Kiyoura cabinet are mostly from the House of Peers, much to the indignation and distrust of the vernacular press. It has been rumored that the cabinet is a stop-gap affair to tide over the event of the marriage of the Prince Regent.

Herewith is a statement from the Japanese press:

The appointment of Premier Viscount Kiyoura and other ministers of State took place yesterday morning at 11 o'clock in Akasaka Palace. The personnel of the Kiyoura cabinet is as follows:

Premier, Viscount Keigo Kiyoura.
Foreign Affairs, Baron Keishiro Matsui.
Home Affairs, Dr. Rentaro Mizuno.
Financial Affairs, Mr. Kazue Shoda.
War, Lieut. Gen. Kazunari Ugaki.
Navy, Admiral Kakuichi Murakami.
Justice, Mr. Kisaburo Suzuki.
Educational, Mr. Senshi Egi.
Agriculture and Commerce, Viscount Toshisada Mayeda.
Railways, Mr. Kenjiro Komatsu.

The postponement of the appointment until yesterday was due to the change in some ministerial posts. Some alterations were rendered necessary when the imperial appointment was being arranged to take place on Sunday.

The aforementioned list when compared with what was previously published shows some changes pointing to the number of vicissitudes the situation passed through before the final decision was reached.

As to the reasons of such hardship, there are many, most of which may be classed as jealousies between cliques and groups. Moreover, there are plausible

causes, one of which may be taken as the Genros recommending Viscount Kiyoura to form a cabinet.

Another childish and foolish reason given for having selected Viscount Kiyoura was the fact of the Prince Regent's nuptials which will take place in the latter part of January. Any child would immediately ask: Any imperial marriage must necessarily trouble political waters, when it is not in any way connected with politics?

It is averred that the satellites of the court do not desire to permit the reins of the Government to fall into the hands of political parties which are formed of men reared outside of the governmental folds. In other words, the bureaucrats attempted to put the Government into safe hands.

Based on such selfish ends, Viscount Kiyoura started to solve his problem. His first resort was the Kenkyukai, the most formidable group of the House of Peers, and he requested their aid in the formation of a cabinet. The Kenkyukai realized that a super-party cabinet was not only an anachronistic step, but one which can not be carried through unless an understanding shall have been arrived at in both houses; in the present circumstances with the Seiyukai in the lower house and Kengyukai in the upper.

The Kenkyukai also proposed the emphatic condition that no person who had ever expressed an antagonistic attitude toward the party would be permitted to enter the cabinet. This concerned Mr. Arimatsu, one of Viscount Kiyoura's protégés whom he had decided to grant a portfolio, but this the Kenkyukai attitude forestalled, and although at first Mr. Arimatsu was looked upon as one of the most possible candidates, he had to be left out. The entrance of Baron Fujimura and Mr. Egi was against the whim of the Seiyukai, who refused to extend any positive support. Such affrontery from the groups from whom the viscount had looked forward for his mainstay decided him to decline the imperial order, and he repaired to the palace and gave his reasons. However, the court did not accept his declination, and again ordered the viscount to form a ministry.

This order sent Viscount Kiyoura out on his second mission, which he entered in a downhearted spirit. It may be said here that the Viscount had no enthusiasm in the formation of a cabinet.

Political quarters looked upon Kiyoura's second attempt as one which would most likely meet the same fate. After many a turn and twist he finally managed to organize.

In the selection of a Minister of War he had to wade between two strong military cliques, the Choshu element, the stronger, and the Satsuma element, headed by Marshall Uyehara, chief of the general staff. Marshall Uyehara had recommended General Fukuda at the request of the Viscount, but this was emphatically opposed by the Choshu clique headed by General Tanaka, the ex-Minister of War. However, Viscount Kiyoura had to waive his first selection and bow down to the stronger element.

In the appointment of a Minister of Navy the same troubles had to be overcome. Admiral Suzuki was the Viscount's choice, but he had to face the opposition of the Satsuma clique headed by Admiral Takarabe, Count Yamamoto's son-in-law. This put the portfolio into the hands of Admiral Murakami.

The Keiyukai had promised to support Viscount Kiyoura in the second attempt to form a cabinet through the influences of Viscount Makino, Minister of the imperial household, and Count Hirata, lord keeper of the privy seal. In the first instance, the Keiyukai demanded that the selection of all the ministers, except the Departments of War and Navy, should be left in their hands. In the second instance, since there were a number of posts already filled, it

was not possible for the Kenyukai to oppose them and, therefore, a number of important Kenyukai members had to be sacrificed.

In short, Viscount Kiyoura's attitude has been the prime cause of such hardships and difficulties in the birth of his cabinet. It is averred that he alone was to blame on account of his lack of conviction and his resorting to others for the formation of his cabinet. Although a bare equilibrium has been created, political gossip has it that the life of the present Government is no healthier than its predecessor and will not be very long.

The appointment was announced yesterday of Mr. Ichita Kobayashi as the chief of the secretariat of the cabinet and Mr. Fumio Goto as the chief of the police affairs bureau of the home office.

Simultaneously with the appointment of the members of the Kiyoura cabinet, the ministers of the Yamamoto cabinet were relieved of their office yesterday.

The new cabinet held its first conference yesterday morning after the imperial appointment of the Premier and other Ministers of State, at which the following appointment was approved: Dr. Rentaro Mizuno, Home Minister, as president of the board for the reconstruction of the capital of Japan; General Tanaka and Admiral Takarabe as military councillors and Mr. Akaike as the chief of the metropolitan police.

It has been decided that Viscount Shin Hamao, vice president of the Privy Council, will be appointed president of the council, succeeding Viscount Kiyoura, and Dr. Baron Nobushige Hozumi, member of the Privy Council, will be named vice president.

The personality of the military members of the cabinet is as follows:

MINISTER OF WAR.

Lieut. Gen. Issei Ugaki, the new occupant of the portfolio of war, is a man of true soldier type. He is still comparatively youthful being 57 years of age, and, though an Okayama man, is known as a favorite with Chishu coterie holding a predominating power in the army. During the Tsingtao campaign he distinguished himself as brigadier commander under General Kamio and his promotion in the army has been rather rapid since then.

In the preceding ministry, he was Vice Minister of war, under General Tanaka, and his appointment to the present portfolio is commented upon by many as but natural and proper, as he was generally considered suitable for the post and regarded as a future war lord. At home, Lieutenant General Ugaki is an affectionate father and very fond of children, of which he has a boy and four young girls, of which the eldest is 13.

MINISTER OF THE NAVY.

Admiral Kakuchi Murakami, Minister of the Navy in the new cabinet, was for long the superintendent of the fleet administration department and is well known as a clear-headed man. He is also revered by his colleagues as a man of extreme uprightness and prudence, being very careful even about small affairs and having comparatively very little of that Bohemianism and boldness which characterize the common personality of the men in the service of arms.

Several years ago, when ex-Priemier Count Yamamoto was in power as the head of the first Yamamoto cabinet, Admiral Murakami (then Captain Murakami) was senior adjutant to the then Navy Minister Admiral Saito, but was relieved of his post and placed on the waiting list for awhile, in connection with the Siemens affairs, in which he was suspected of being implicated, but the doubt having been cleared up he was restored to active service and appointed to an important post.

YUBARI.

While holding the post of the chief of the naval arsenal at Kure over 10 years ago he established his name in the successful construction of the super-dreadnaught *Fuso*, which was the strongest and most powerful battleship afloat. After holding various important posts, including that of commander in chief of the naval stations at Kure and Sasebo, successively, he was appointed war councillor the year before last and has since been leading a rather quiet life at Zushi.

Being a man of Saga extraction, Admiral Murakami has rather close connections with the Satsuma elements and is a close friend of Admiral Takarabe, the retired minister, the late Admiral Kato and Admiral Yamashita. In the Russo-Japanese War and in the Tsingtao campaign he took an active part and rendered distinguished service to the State. The new Navy Minister is the oldest member of the new Cabinet next to Premier Viscount Kiyoura and is 63 years old. He has no son of his own, Mr. Chonosuke, his heir, being an adopted son.

FRANCE.

LOSS OF DIXMUDE.

January, 1924.

The French naval airship *Dixmude*, which was formerly the German *L–72*, left the aerodrome at Cuers Pierrefeu near Toulon at 5 a. m. on Tuesday, December 18, on a cruise to Algeria and parts of the Sahara Desert. In addition to the regular crew, the airship had on board 5 officers of the French naval general staff. The purpose of the cruise was announced to be a preliminary air survey of parts of the proposed route for the trans-Sahara Railway. The airship was in command of Lieut. Commander Duplessis de Grenedan, French Navy. The course over the Mediterranean across Algeria and into the Sahara was followed, and it is reported that at 4.20 p. m. on the 19th the airship passed over M'Salah. It appears that shortly after this time it turned back to the northward, as on the 20th it was signaled about 50 miles south of Biskra, where it acknowledged receipt of storm warnings. It appears probable that the commanding officer had received intimation of this storm prior to that time.

From the 20th the reports as to the movements of the airship conflict, but it is understood that the French ministry of marine was more or less in touch until the probable time of its loss. In any case the *Dixmude* was combating a strong northwesterly gale. It appears that disaster overtook the *Dixmude* at about 2.30 a. m. December 22 in a position somewhere between Tunis and Sicily. Press reports were received to the effect that Sicilians saw what appeared to be a large ball of fire somewhere to the southward about this time. On December 28 Italian fishermen found the body of the commanding officer in their nets near the port of Sciacca. Since that time

various articles which apparently belong to the airship have been found in this general locality, one article consisting of a petrol tank which was later identified as being a spare tank carried in one of the cabins.

The general constructional features of the *Dixmude* are undoubtedly well known to the Bureau of Aeronautics. The general impression seems to prevail in British air ministry circles that it was an extremely fragile airship, and that if we take as a basis the factor of safety of the *Shenandoah* at 2, the *R–38* (*ZR–2*) at 1½, the *Dixmude* was probably about 1¼. The British base their assumption on their study of the *L–71*, which was delivered to this country by the Germans and is now in the shed at Pulham.

All the available evidence seems to point to the fact that the *Dixmude* broke up in the air, and that it was either struck by lightning, set on fire, and collapsed, or that it collapsed due to unusual stresses caused by gusts. The post-mortem on the body of the commanding officer indicated that he fell from a considerable height while in the cabin, as his body was badly broken up and a large splinter of wood was embedded in him. Major Scott, who commanded the *R–34* in its trans-Atlantic flight and who is probably one of the best authorities in England on airships, is firmly convinced that the accident was a collapse in the air due to gusts rather than lightning.

The loss of the *Dixmude* has undoubtedly had a very marked deterrent effect with regard to the proposed Burney airship scheme. The British Labor Party is not very enthusiastic about that scheme, and, with that party coming into power, it is probable that no steps will be taken toward passing of the Burney airship legislation during the present session of Parliament.

ITALY.

AIRPLANE CARRIERS.

January, 1924.

The Italian Navy Department has taken over for conversion into an airplane carrier a small auxiliary cruiser of the Italian Navy under construction at Spezia, which was originally intended for commercial operation by the Italian State Railways between Naples and Palermo. The ship was launched on December 20, 1923, and christened *Guiseppe Miraglia* in honor of Commander Miraglia of the Italian naval air service, killed during the war.

The *Guiseppe Miraglia* is a 4,500-ton ship, equipped with two turbine engines, and has a speed of 22 miles per hour. The superstructure is being made into hangar space and will accommodate nine

medium-sized airplanes (observation and pursuit). The airplanes are to be launched from the upper deck by means of a system of fixed rails instead of a catapult. There is no landing deck. The machines are taken on board from the water by means of cranes and tackle. This ship is expected to be completed in the late spring of 1924.

ITALY.

CIVILIAN AVIATION.

January, 1924.

There are 111 machines regularly inspected, registered, and available for commercial purposes. They are almost entirely military types that have been adapted for this purpose.

At the present time there are no commercial air lines in actual operation. At Rome, Naples, Milan, Turin, and Florence there are small aerial transportation companies that transport passengers and merchandise and take up passengers for short pleasure trips. When the new commissariat of aviation decided on building up its new military air service the best of these companies were given contracts for the preliminary training of flying personnel for the military air service, so that they are almost entirely engaged on that work at present.

Air routes have been regularly studied and organized and the ground organization is very complete. These routes are frequently traversed by military and a few commercial machines. The commissariat plans to establish its first commercial line from Brindisi to Cairo in the spring of 1924. It is to be a seaplane line.

Italy is small for commercial air routes unless operated in conjunction with international lines. Numerous conferences between the Italians, French, and British have taken place within the last two years to establish lines to Africa and the Near East. Nothing was accomplished due to disagreements as to what part of the personnel, material, equipment, etc., should be furnished by the respective countries.

During the calendar year 1921 about 9,000 passengers were carried. No figures are obtainable concerning the passengers carried in 1922 and 1923, but there has been a great decrease due to the concentration of all facilities on building up a large military air service by June 30, 1924, and due to the financial failure during 1922 of the most important of the aerial transportation companies—the S. A. I. A. M. Co.

ARGENTINA.

NAVAL AVIATION STATIONS.

January, 1924.

At present there are two naval aviation stations in Argentina:

The naval aviation school and base at Puerto Belgrano and the naval "Aerostacion" school at Fuerte Barragan (La Plata).

The station at Puerto Belgrano is situated in the naval station along the water front to westward of the wet basin and the dry docks.

The station is for purpose of training the personnel—pilots, ground force, mechanics, observers, photographers, etc., for the defense of the naval base; and for combined operations with the fleet off Bahia Blanca.

When the station is completed there will be facilities for training on sea and land planes.

The equipment of this station consists of the following:

UNDER CONSTRUCTION.

(*a*) One brick building for officers and chief petty officers, capacity 20 officers and 40 chief petty officers; two floors, hall for lectures, central heat, telephones, electric light, etc., ample accomodations.

(*b*) One two-story building for men, capacity 350 petty officers, sea apprentices and conscripts. Equipped as above.

(*c*) One kitchen for above buildings, completely equipped.

(*d*) One shop for construction, repair, and mountings. Steel framework, asbestos lined, dimensions 55 by 35 meters square. In upper part storerooms for material. An electric crane, 5-ton lifting power.

(*e*) Two storehouses, concrete, area 200 square meters each.

(*f*) Three hangars, 30 by 60 meters square each, steel framework. concrete floors, asbestos lined, doors, front and rear with 40-meter opening. Additional for land planes.

(*g*) One aerodrome with 40 hectares of very level ground for taking off and landing; one hangar 15 by 30 meters; one pigeon house for carrier pigeons.

COMPLETED.

(*a*) One hangar similar to item (*f*), above.

(*b*) Two metal hangars 800 square meters each. They have special installations of compressed air, electric light, storerooms, etc.

(*c*) One workshop for machinery and motors, 450 square meters area. When the new workshop is completed this building will be used for storage.

(*d*) One photographic laboratory, 300 square meters surface.

(*e*) One workshop for electricity and radio, construction similar to above, fitted with all necessary electric and radio equipment.

(*f*) One carpenter shop, 300 square meters, fully equipped.

(*g*) One propeller shop.

(*h*) Added to these buildings the school has special installations for compressed air, autogenous soldering, blacksmith shop, tinsmith shop, apprentices workshop, etc.

(*i*) Two electric cranes for launching and hoisting planes.

(*j*) One launching platform made of wood.

(*k*) One observation tower fitted with weather vanes and proper instruments.

FLYING EQUIPMENT.

1. Twelve Avro seaplanes, 150 to 180 horsepower Wolseley Viper motors.

2. Seven H. S.-2-L flying boats, 350 to 400 horsepower low-compression Liberty motors.

3. Seven F-5-L flying boats, each 2 high-compression Liberty motors, 400 to 450 horsepower. Did have 8 but one destroyed by gale while at anchor in inner harbor.

4. Four Vickers Viking Amfibians, 450 horsepower Napier-Lion motors.

5. Four Dornier all-metal monoplanes (not yet delivered). Flying boat type of duraluminum and steel. Liberty motors.

The "Aerostacion" School at Fuerte Barragan is situated about 2 miles northwest of the naval base Rio de la Plata (Rio Santiago).

It is for the purpose of training the personnel for piloting and handling dirigibles and balloons.

The equipment of this station consists of the following:

2 hangars.

1 hydrogen plant.

Workshop and barracks.

Air equipment (all purchased in Italy):

2 dirigibles, type 0, semirigid.

2 observation balloons, type A. P.

2 spherical balloons, type M.

6 individual parachutes, type Nobile Spera.

2,000 small balloons for aerological observations.

The two envelopes for the dirigibles were sent to Italy for repairs early in 1923 and have just been brought back on the transport *America* arriving in B. A. January 10, 1924.

The station has been closed during the absence of the envelopes, but will start operations again January, 1924.

ARGENTINA.

NAVAL AVIATION NOTES.

January, 1924.

In general the naval aviation personnel is active, painstaking, and hardworking. About one-half of the pilots, and all of the instructors have been to our aviation school in Pensacola.

The naval aviation school has been operating about two years and during that time there have been only six accidents, all minor, no fatalities and no serious injuries. This speaks well for the training of the personnel and the upkeep of the material.

The aviation school and base at Puerto Belgrano is almost completed. It has been built in a very short time and with very little money, most of the work being done by the officers, petty officers, enlisted men, and conscripts.

A short time ago I visited this base and was surprised to see so much accomplished in such a short time. All hands are very proud of what they have done and are enthusiastic about the future.

The leading figures in Argentine naval aviation are:

Commander Aureliano Rey, chief of naval aeronautic service (subdivision of the general staff), a very capable officer but without flying experience.

Commander Juan G. Ezquerra, director of naval aviation school, Puerto Belgrano. Also a capable officer but without flying experience.

Lieut. Commander Ricardo Fitzsimon, director of naval aerostatic school, Fuerte Barragou. Very capable officer and a graduate of Pensacola School.

Lieut. Commander Ceferino Pouchan, chief instructor, naval aerostatic school; same as above.

Lieut. Commander Marcos Zar, chief instructor, naval aviation school, Puerto Belgrano; same as above.

Lieut. (Junior Grade) Victor M. Padula, Member Argentine Naval Mission in Europe; graduate of Pensacola.

ARGENTINA.

PROPOSED BUILDING PROGRAM FOR 1924.

January, 1924.

When the Argentine Congress meets this spring, the Ministry of Marine will ask for the approval of and funds for the following building program:

Six submarines similar to United States, *S–40* type.
Six destroyers.
Two light Cruisers, *Richmond* type.

PHILIPPINES.

A VISIT TO MINDANAO.

December, 1924.

The following extracts are taken from the report of a destroyer division commander, after a cruise of that division to Mindanao and Sulu, with commission appointed by the Governor General, November 26 to December 9, 1923. The intention of this commission was to investigate the grievances of the Moros, particularly in Mindanao, where there recently has been considerable disaffection and disorder:

Upon arrival of the division at Camp Overton, the provincial governor, governmental officials, and a considerable number of datos were on the dock and came on board the ship immediately for conference. The datus showed a very keen interest in the ship, but they could not be induced to look her over while the conference was going on, so great was their apparent concern with the result of the proceedings. The session lasted from 8 a. m. until 1 p. m., and was a succession of complaints on the part of the Moro datos against paying taxes, sending their children to school, and particularly against being governed by Filipinos instead of Americans whom they called their "fathers and mothers" as we had "conquered them."

It was learned that several dato adherents of the Amai Bianing faction had gathered their followers, about 150 Moros, into their "cotta," or fort, across the lake at a place called "Sitio of Tatayanan," Tamparan. These Moros had gone "contra" the Government, their great grievance being that they were being governed by Filipinos and being killed by Filipino Constabulary. They refused to pay their taxes or to send their children to school. They demanded justice for the killing of Amai Binaning, who had been hunted down by the constabulary, assisted by those four Moros; they had been cooped up in their "cotta" for some two months; had "sworn to die, and expected death," and they had dared the constabulary to come and get them. There was a constabulary company post within a mile of them.

It was decided that these datos must be seen, so on the following day the party arrived at the constabulary post at Tamparan by launch, where it was met by the Filipino officer commanding the constabulary there, who accompanied the party to the outskirts of the village and then excused himself. The Sultan and one dato preceded about one-half mile to give notice of the arrival of the party, which proceeded from the village along a filled-in straight trail over a flat marsh and jungle with high grass. The "cotta" was pointed out by the dato who was with us, as being inside a large conspicuous bamboo grove a half mile farther on to the right of the trail. At this moment we heard a clamorous beating of tom-toms, followed by piercing shrieks and prolonged yells. These yells continued at intervals.

The party followed the dato guide to the edge of a bamboo grove where a deep ditch, 15 feet wide, was crossed on a bridge made of a single bamboo pole with a small bamboo handrail. The party was now well inside the thicket or grove on a zigzag path which had been cleared. Another and deeper ditch a hundred feet from the first one was crossed by a similar bridge. After another hundred feet of zigzag clearing we came out into the clearing, or "patio," of the cotta. A hundred yards farther on the Moros were seen waiting, grouped among their several thatched houses, each inside its own individual "cotta." The tom-toms were still beating, and they were still yelling. As we approached it could be seen that they were all—men and women alike—dressed in most gorgeous clothes and armed with magnificent cutting weapons of many descriptions, but no firearms. The two leading datos, very young, were first presented by the Sultan, who had preceded the party. They looked very wild and very excited, panting like dogs, and their eyes literally bulged half out of their heads. They looked like Filipino mess boys in costume gone amuck. They had worked themselves into a fine state of frenzy. One of them, after refusing a cigarette, grumbled something or other and started a dance, leaping and swaying easily from side to side and slashing his kampilan through the air; the yelling and pom-pomming started all over again. It was getting dark, and the colonel asked that we go into a house and talk it over. We afterwards learned that a Moro will not harm a guest in his house. We climbed up a bamboo ladder into a fairly large shack; a single oil lamp was brought and suspended by a wire from the roof and hovered over the party grouped under it, the Americans on rice sacks facing the Moros, who squatted and sat and stood in front. The colonel talked to them like children for half an hour, calming them down before any one of them said a word; he told them stories which eventually provoked a smile, and it was hoped the worst was over as they grinned when a dog made a dash through the gloom for a yowling cat.

Then one after another complained of being governed by Filipinos who they said did not understand them or their religion; they refused to pay taxes on land as the earth was God's, not the Filipinos'; the Filipinos did not build their houses or grow their crops; the personal head tax (cedula) was refused, the Filipinos were not their parents and so not responsible that they had been born; schools only produced intolerable children who thought that they knew more than their elders. They would themselves avenge the killing of Amai Binaning and they were ready to die; but they all wanted Americans to rule over them.

The colonel took up their grievances one by one; first, at their request, signing an order written on the spot forbidding the constabulary to molest unless attacked. The other matters were more easily disposed of but no promises were given. The conference broke up at 9 p. m. with some indications that

they might go sensibly to work again. For the first time in two months these Moros left their "cotta" as escort to protect the party against the constabulary and other evils, with yells and slashing of knives in a torch light parade to the outskirts of the village.

At Jolo Jolo, the provincial governor, an American, with various officials, came off to the ship at once for conference with the commission and upon leaving was saluted with seven guns even though it was Sunday, to impress the large crowd of natives gathered on the pier and on shore. The commission held a conference with leading datos at the government house in the afternoon. There were no complaints whatever from these datos who appeared to be satisfied in every way. There was a general air of contentment, happiness, and prosperity about them that was a great contrast to the conditions found in Lanao.

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NAVY DEPARTMENT.
Washington, D. C.

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In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines.

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1924.

This is the first of a series of supplements to the MONTHLY INFORMATION BULLETIN which it is proposed to issue from time to time as suitable articles come to hand. By this means it is hoped that the "Office of Naval Intelligence" may supply the medium, hitherto largely nonexistent, for circulating to the forces afloat those articles upon service topics which, while valuable and interesting, are also confidential, and therefore unsuited for publication in the regular service journals or in the Naval Institute, and which because of their length can not be included in the regular issues of the BULLETIN.

It should be understood that this office takes no attitude of its own with regard to the facts and conclusions stated by the author.

In the present article certain of the conclusions and recommendations of Lieutenant Commander Frost have been set up in modified type for the sake of convenience in study. They were not so written in the original copy obtained from him.

The diagrammatic sketches following the text are taken from a pamphlet originally prepared by Lieutenant Commander Frost in December, 1921, and revised and enlarged in June, 1923. They serve to illustrate many of the points brought out in the text and in general show the disposition of the opposing forces at important stages of the Jutland operation.

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AN ANALYSIS OF JUTLAND.

BY LIEUT. COMMANDER H. H. FROST, U. S. NAVY.

INTRODUCTION.

As the course of the Battle of Jutland from the historical viewpoint has been now well established, it may be appropriate to make a detailed analysis of the battle from a strictly professional point of view.

A great number of facts concerning the battle have been collected and arranged under a variety of subjects, which are grouped under four main heads as follows:

(*a*) Gunnery.

(*b*) Effects of gunfire.

(*c*) Torpedo fire.

(*d*) Handling of naval forces in action.

An analysis has been made of the facts, of which it is not pretended that all are absolutely accurate, and conclusions have been drawn from them. Where pertinent, certain recommendations or suggestions, based on the conclusions, have been offered.

It is realized that there may, and probably will, be considerable difference of opinion concerning the conclusions and recommendations. If so, it is suggested that this may arouse discussion and stimulate interest in fleet battle tactics—the real purpose of this paper.

The facts upon which this paper is based were drawn mostly from the following sources:

(*a*) "Battle of Jutland—Official Despatches," published by the British Admiralty. This publication contains a great amount of valuable material and is the most complete source of information concerning the battle thus far published.

(*b*) "The Fighting at Jutland" (unabridged edition). This is a splendidly edited series of personal accounts of the battle, many of which are masterpieces. While this book repeats some of the information contained in the Official Despatches it contains a great amount of new material. The book is notable for the spirit of frankness and fairness which pervades it.

(*c*) "The Two White Nations," by Georg von Hase. This is an excellent and most accurate account of the battle from the viewpoint

of the gunnery officer of a German battle cruiser. It contains much valuable information, concerning gunnery in particular.

(*d*) "Official Report of the Austria-Hungarian Naval Attaché at Berlin." This was a confidential paper and has the value of not having been issued for propaganda purposes. It is a particularly fine report and contains detailed statements of the damage sustained by most of the German vessels.

(*e*) "Official Report of Admiral Scheer," as published in the British Official Despatches. This includes seven excellent track charts of the German forces.

PART ONE.—GUNNERY.

I. RESULTS OF GUNFIRE OF BATTLESHIPS, BATTLE CRUISERS, AND CRUISERS AGAINST VESSELS OF SIMILAR TYPES.

It has been found that most of the data concerning the gunfire of the above types of ships can be condensed into a table. This table—No. 1—shows the following data in its columns:

Column 1.—Name of firing ship.
Column 2.—Name of type of target ship.
Column 3.—Average range during the shoot.
Column 4.—First salvo of the shoot to straddle.
Column 5.—First salvo of the shoot to hit.
Column 6.—Total number of salvos in the shoot.
Column 7.—Total number of hits in the shoot.
Column 8.—Remarks—causes of ending the shoot.

TABLE 1.—*Shoots of battleships, battle cruisers, and cruisers on vessels of similar types.*

1	2	3	4	5	6	7	8
Marlborough	Battleship	11,000	.....	5	7	2	Target lost in smoke.
Do	....do	13,000	.....	.....	1	0	Target lost in mist.
Do	....do	10,750	6	6	14	5	Target lost in smoke screen.
Lion	Lutzow	16,500	4	.....	4	0	Shoot continued; no further data.
Malaya	Von der Tann	19,000	4	4	4	1	Do.
Bellerophon	Derfflinger	11,000	3	3	4	1	Target lost in smoke screen.
Colossus	....do	8,500	4	4	5	4	Lost in smoke screen.
Do	Battleship	12,000	.....	.....	3	0	Very misty; lost target.
Iron Duke	Konig	11,000	3	3	9	2	Lost in smoke screen.
Do	....do	12,000	2	2	4	6	Do.
Do	....do	15,400	.....	.....	4	0	Do.
Hercules	Battleship	13,000	.....	.....	8	0	Very misty; hits possible.
Do	Seydlitz	9,000	5	5	6	2	Lost in smoke screen.
Revenge	Battleship	12,000	.....	.....	3	0	Unable to see splashes.
Do	Lutzow	10,000	2	2	8	4	Shifted to Moltke.
Do	Von der Tann	10,000	2	2	8	2	Lost in smoke screen.
Neptune	Battleship	11,000	.....	.....	2	0	Very misty; lost target.
Do	Derfflinger	10,200	3	3	4	2	Lost in smoke screen.
Collingwood	....do	8,000	2	2	4	2	Do.
Royal Oak	....do	10,900	.....	.....	6	0	Very misty; hits possible.
Conqueror	Battleship	12,000	.....	.....	1	0	Lost in mist.
Orion	....do	13,300	4	4	4	1	Do.
Do	Battle cruiser	19,000	5	.....	6	0	Lost in smoke screen.
Monarch	Battleship	12,000	2	.....	2	0	Lost in mist.
Do	....do	12,000	.....	.....	1	0	Unable to see splashes.
Do	Battle cruiser	18,000	4	.....	5	0	Hits possible.
Thunderer	Battleship	13,000	2	2	3	4	Iron Duke masked fire.

TABLE 1.—*Shoots of battleships, battle cruisers, etc.*—Continued.

1	2	3	4	5	6	7	8
Ajax	Battle cruiser	19,000	.....	.....	1	0	Fourth Light Cruiser Squadron masked fire.
King George V	Battleship	12,800	.....	.....	1	0	No remarks.
Benbow	do	13,000	.....	.....	1	0	Lost in mist.
Do	do	13,000	.....	.....	2	0	Do.
Do	do	12,500	3	.....	3	0	Do
Do	Derfflinger	12,000	4	4	(?) 5	(?) 1	Lost in smoke screen.
Canada	Battleship	14,000	3	.....	4	0	Lost in smoke.
Temeraire	Battle cruiser	12,000	.....	.....	7	0	Hits possible.
Princess Royal	Lutzow	16,000	3	6	6	1	Continued fire; no further data.
Do	Lutzow and Derfflinger.	18,000	.....	.....	(?) 15	0	18 minutes' fire; hits possible.
Do	Battleship	10,000	2	2	3	2	Lost in smoke screen.
Tiger	Moltke	18,500	3	.....	3	0	Continued fire; no further data.
Do	Seydlitz	14,000	2	2	2	1	Do
Do	Derfflinger	18,000	.....	.....	2	0	No remarks.
Barham	Von der Tann	19,000	3	.....	5	0	Hits possible.
Warspite	Konig	17,000	3	.....	3	0	No remarks.
Superb	Derfflinger	11,000	3	3	4	2	Do.
Moltke	Tiger	16,500	2	2	6	4	Continued fire, no further data.
Lutzow	Defense	8,000	3	3	3	4	Defense sunk.
Do	Lion	17,000	3	3	3	1	Continued fire; no further data.
Von der Tann	Barham	19,000	3	3	3	1	Do.
Do	Indefatigable	19,000	.....	(?) 11	(?) 12	6	Indefatigable sunk.
Seydlitz	Colossus	8,500	2	2	5	3	Many hits by splinters in addition.
Derfflinger	Princess Royal	17,000	6	(?) 10	(?) 10	1	Continued fire; no further data.
Do	do	14,000	(?) 1	(?) 1	8	2	Large rate of change.
Do	do	18,000	.....	.....	8	0	No remarks.
Do	Queen Mary	14,500	4	4	9	9	Queen Mary sunk.
Do	Defense	8,000	3	3	3	4	Entire salvo hit.
Do	Invincible	9,300	1	1	4	8	Invincible sunk.

In addition there is the following less definite data concerning shoots:

(*a*) *Centurion* fired a number of salvos at a battleship at 17,500 yards without hitting.

(*b*) *Barham* hit the *Moltke* three times in 20 minutes continuous fire at 18,000 yards range.

(*c*) *Queen Mary* hit the *Derfflinger* twice in 10 minutes firing at about 14,500 yards range.

(*d*) *Warspite* fired a number of salvos at the *Von der Tann* at 19,500 yards range without hitting.

(*e*) *Agincourt* made about five hits out of 144 rounds of 12-inch while making three shoots at battleships and battle cruisers at about 10,500 yards range.

(*f*) *St. Vincent* kept closely on the target for 32 minutes at about 9,700 yards; 96 rounds were fired and hits probably made.

The following are further facts concerning the gunnery of battleships and battle cruisers:

(*a*) The gunnery remarks of the *Princess Royal* for the period from 3.48 to 8.36 claim 13 straddles and 2 possible straddles out of approximately 80 single-barreled salvos.

(*b*) Practically all salvoes were single barreled and consisted of from four to five guns; where turrets were put out of action, salvos sometimes were of only two guns.

(*c*) Admiral Jellicoe makes the following statement: "It is also undoubted that the gunnery of the German battle cruisers in the early stages was of a very high standard. They appeared to get on their target and establish hitting within two or three minutes of opening fire in almost every case, and this at the very long ranges of 18,000 yards."

(*d*) One of the unexpected developments of German gunnery was the use of their secondary batteries against capital ships. For short periods when the main battery gunfire was steady on the target two secondary battery salvos were fired between main battery salvoes. The *Tiger* reports five secondary battery hits; the reports of the *Lion* and *Princess Royal* indicate that they were also hit; the *Warspite* was hit at least twice and the *Warrior* six times, although some of these shells may have come from light cruisers. While these hits had no important effect, they doubtless caused some damage in the aggregate and certainly interfered with the enemy's gunfire.

(*e*) There was only one instance of large vessels being engaged during darkness, although there were several contacts. The cruiser *Black Prince* was sighted by the German battle fleet at 1,650 yards range; she was hit repeatedly without her fire having any effect on the Germans; after having been under fire for four minutes the *Black Prince* was destroyed by a magazine explosion.

The following conclusions are considered to have been demonstrated by the above-cited facts:

(a) When the visibility is good, when smoke screens are not used, and when destroyers and light cruisers make no attempt to attack the capital ships of the enemy, the shoots at one target will be moderately long and may consist of from 15 to 25 salvos.

(b) These conditions may be found in a battle-cruiser action, but they will seldom be experienced in a main-fleet action; here the shoots will seldom consist of more than eight salvos and often will be of but two or three. Out of 56 shoots, 32 consisted for four or less salvos.

(c) It is almost a certainty that hitting or straddles can not be expected with the first salvo. There were only two cases of this out of 56, and one of these is doubtful and in the other the range was but 9,300 yards.

(d) Hitting or straddling on the second salvo is exceptional. There were but 10 cases out of 56. Most of these occurred where the range was not over 12,000 yards.

(e) It requires good work to straddle with or before the third salvo. The Germans did this 8 times out of 12 and the British 18 out of 44. This confirms Admiral Jellicoe's statement that the German battle cruisers established hitting within two or three minutes in almost every case, but it must be realized that the shooting of these cruisers was of an exceptionally high order and superior to that of any other force engaged in the battle. As only German battle cruisers are represented in Table 1, the above figures do not necessarily prove that the German fire as a whole was better than the British.

(f) Often excellent results were obtained by ships which did not find the target for a long time. As examples there are the shoot of the "Marlborough," where one hit was obtained in the sixth salvo and real hitting did not begin until the twelfth, and that of the "Von der Tann," where apparently no hits were made until the eleventh salvo, at which time hitting commenced at the rate of six hits in two salvos, sinking the "Indefatigable."

(g) At short ranges the secondary battery may be used effectively against capital ships.

On the basis of these conclusions the following recommendations are offered:

(a) A long-range experimental practice be held in which 20 rounds per gun are allowed. This practice might be fired by the ship winning the gunnery trophy the preceding year.

(b) An experimental practice be held in low visibility at 10,000 yards range; four anchored targets to be used, separated by a distance of at least 1 mile and placed along an irregular line; 12 rounds per gun to be allowed; three rounds per gun might be fired at each target or the firing ship be allowed to use any target visible; speed should be 18 knots so as to compel shifting of target; as an additional feature the chief observer might announce to the director pointer that the target being fired at has become invisible, and thus force a change of target. Another possible plan would be to have the targets hidden from the firing ship by a smoke screen laid by a destroyer division, the firing ship being to windward; fire to be commenced on any target which becomes visible through the smoke screen.

(c) An experimental practice to be held at medium range with the secondary and main batteries firing at the same target.

II. RESULTS OF THE GUNFIRE OF BATTLESHIPS, BATTLE CRUISERS, AND CRUISERS ON LIGHT CRUISERS.

A most important feature of the battle was the great difficulty of hitting light cruisers in a day action. This was due mainly to the following facts:

(*a*) The small target offered by a light cruiser of 5,000 tons, which is not generally realized.

(*b*) The large and rapidly changing rate of change of range which will almost always be found in firing at light cruisers.

(*c*) The fine maneuvering qualities of light cruisers, which permit them to steer a zigzag course while under heavy fire.

The following are instances of fire of capital ships on light cruisers:

(*a*) Fifth Battle Squadron, which did particularly good shooting, fired at four German light cruisers at ranges of from 17,000 to 19,000 yards from three to five salvos, making no hits; *Warspite* claims one straddle.

(*b*) A large number of German battleships fired at the four light cruisers of the Second Light Cruiser Squadron for about 50 minutes at ranges between 13,000 and 18,000 yards. So extremely heavy and accurate was the fire that an officer of the *Southampton* says: "We all compared notes afterwards, and decided that during this hour about 50 to 60 shells fell within 100 yards of the ship, and many more slightly farther off." Not one hit was made on the four ships composing the target.

(*c*) The three ships of the Third Battle Cruiser Squardon fired for about 10 minutes at 9,000 yards on the four light cruisers of the Second Scouting Division, which were proceeding on parallel courses so as to make the rate of change very small. The *Wiesbaden* and *Pillau* were each hit by one 12-inch shell, but the other ships were not hit.

(*d*) The *Warrior* and *Defense* each fired three salvos at the *Wiesbaden* at 16,000 yards range without hitting.

(*e*) A large number of German battleships fired at the four light cruisers of the Second Light Cruiser Squadron at a range of about 12,000 yards without hitting. A great number of shells fell close aboard.

(*f*) The *Lutzow* and *Derfflinger* fired at the *Falmouth* and *Yarmouth* about five salvos of 6-inch at a range of 5,500 yards; one minor hit on *Yarmouth's* mast was made; the German ships were under a heavy fire from British battleships at this time, and this doubtless reduced the effectiveness of their fire.

(*g*) *Princess Royal* fired four salvos at the *Regensburg* without hitting.

(*h*) The five ships of the Fourth Light Cruiser Squadron were fired at by a column of German battleships at about 7,000 yards for 10 minutes. *Calliope* was hit with one 12-inch shell and four 6-inch. Three battleships were firing at the *Calliope* alone; their fire was very accurate and the light cruisers were covered with splashes. No other vessels were hit.

(*i*) Three British light cruisers of the Fourth Light Cruiser Squadron were fired at by German battleships, second line, for eight minutes at ranges of from 5,200 to 8,000 yards. The Germans straddled with their first salvo, but not a single hit was made.

There were in all 37 light cruisers at Jutland. That they were under fire for long periods is demonstrated by the above-cited data. The fact remains that but three main battery and five secondary hits were made, except in the case of the *Wiesbaden*, which lay dead in the water between the lines and was fired at by almost the entire Grand Fleet.

It is recommended that a form of experimental practice be developed in which the target has a speed of 25 knots, proceeds on a base course to give a rate of change of at least 25 knots, and is allowed to zigzag after each salvo.

The practical development of such a practice will doubtless be difficult, but it is one of the greatest importance. It might be possible to have a destroyer tow a small point of aim; an old "H8–2" seaplane might be suitable for the point of aim. Another possibility would be an old destroyer controlled by radio. A destroyer might be used as the target and the fire offset in the way used in the Grand Fleet.

As a matter of interest, a table has been composed showing the results of some shoots at the *Wiesbaden* after it was dead in the water.

TABLE 2.—*Shoots of battleships, battle cruisers, and cruisers at the Wiesbaden, stopped and crippled.*

1	2	3	4	5	6	7	8
Iron Duke	Wiesbaden	11,000	3	.....	4	0	Very misty.
Marlborough	do	9,000	3	3	4	2	
Do	do	10,500	.....	.....	5	0	
Colossus	do	12,000	.....	.....	4	0	Do.
Do	do	9,700	.....	.....	3	0	Do.
Monarch	do	10,400	3	.....	3	0	Off in deflection.
Canada	do	13,000	.....	.....	2	0	Lost in mist.
Benbow	do	13,000	.....	.....	1	0	Do.
Vanguard	do	11,000	4	4	9	3	
Temeraire	do	11,000	3	3	5	2	
Hampshire	do	9,500	2	2	4	0	
Defense	do	9,000	2	2	2	1	Continued fire.
Warrior	do	9,000	2	2	2	1	Do.
Vanguard	do	9,500	3	3	3	1	Lost in smoke.
Superb	do	10,400	3	3	4	2	
Thunderer	do	12,000	.....	.....	2	0	
Conqueror	do	12,000	.....	.....	2	0	
Hercules	do	10,000	.....	.....	1	0	Very misty.
Neptune	do	10,000	.....	.....	1	0	Overconcentration.
St. Vincent	do	11,000	.....	.....	3	0	
Royal Oak	do	10,900	1	3	4	1	

In addition to the above fire of 68 salvos of main battery guns for a total of 13 hits at an average range of 10,000 yards, the *Revenge*, *Agincourt*, *Collingwood*, *Royal Oak*, and *Barham* fired an unknown number of salvos at the *Wiesbaden;* the *Royal Oak* fired three salvos of 6-inch which straddled, and the *Tiger* fired several salvos of 6-inch, noting hits.

It can scarcely be believed that 25 ships fired at a single light cruiser, broken down and lying dead in the water, at medium range, without sinking it immediately. This is even more remarkable when it is considered that the firing ships were themselves under a very slight fire and received not a single hit while firing. This result may be attributed to the following facts:

(a) A light cruiser offers a much smaller target than is generally considered.

(b) The visibility was undoubtedly very poor during some of the above firing.

(c) There was a decided overconcentration on the "Wiesbaden."

(d) A light cruiser may sustain a great amount of damage without sinking.

III. RESULTS OF GUNFIRE OF BATTLESHIPS, BATTLE CRUISERS, LIGHT CRUISERS, AND DESTROYERS AGAINST DESTROYERS DURING DAYLIGHT.

There were a large number of torpedo attacks made by destroyers during the day section. Each attack will be considered separately and detailed data will be presented.

A. Attacks of British Destroyers on German Battle Cruisers and Battleships, Commencing at 4.30 p. m.

At the beginning this attack may generally be considered as supported by the fire of the British battle cruisers and battleships, but toward the end the ranges between the capital ships became so great and the fire was so ineffective that the attack should be classified as unsupported.

Nestor at 4.35 came under fire from German destroyers at 10,000 yards range, which decreased to 1,000 yards, ceasing at about 4.45. At 4.37 she came under heavy and accurate fire from the secondary battery of the battle cruisers, commencing at 7,000 yards and running down to about 5,000 yards. At 4.48 the range had increased to 8,400 yards and fire was ceased. At about 4.50 the light cruiser *Regensburg* opened fire at about 5,000 yards' range and by 5.00 had hit *Nestor* twice. These shells put *Nestor* out of action, and she remained dead in the water; the leading vessels of the German Battle

Fleet sank the *Nestor* with main and secondary batteries at ranges from 5,000 to 3,000 yards in about three minutes.

Nomad at about 4.37 came under the fire of German destroyers at ranges which decreased to 1,000 yards and also under the fire of German battle cruisers at ranges from 7,000 to 5,000 yards. After five minutes' fire she was hit by two 6-inch shells of a battle cruiser, possibly the *Derfflinger*, and was put out of action. She was later sunk by the main and secondary batteries of the leading vessels of the German battle fleet in about three minutes. She was able to fire her last torpedo at 2,000 yards, and only sank when the range had decreased to 500 yards.

The *Nicator* followed the *Nomad* and, after she was injured, the *Nestor*. She was under fire from the German destroyers at from 5,000 to 1,000 yards and the battle cruisers from 7,000 to 5,000 yards for about 10 minutes. "All this time," writes an officer of the *Nicator*, "we were under an unpleasantly hot fire from the German battle cruisers' secondary battery, and it seemed nothing short of a miracle that we escaped being hit." After the *Nestor* was put out of action by the *Regensburg* the *Nicator* was under the fire of the secondary batteries of the leading vessels of the battle fleet for at least 10 minutes at ranges as low as 3,000 yards. "It seemed perfectly extraordinary," writes the officer above quoted, "that, in spite of the tornado of shells falling all around us, we were never hit once except by a few splinters." The zigzag course of the *Nicator* was largely responsible for this result.

Moorsom followed the *Nicator*, and, while her reports are incomplete, it is reasonable to assume that she was under fire practically to the same degree as the *Nicator*. She was hit once by a 4.1-inch shell from a destroyer. The escape of these two vessels is thus described by an officer of the *Galatea:* "They appeared directly astern of us out of a thick cloud of funnel smoke which they were making to screen themselves, zigzaging like a couple of snipe, at times their high bow wave the only part of them visible, and a tornado of shells were falling around them. Apparently they could watch the flash from the ships firing at them, and then put their helms over, and the place where they had been a moment before, still barely a ship's length from them, would be lashed and torn into tall pillars of water. It seemed impossible that they could escape, as time after time they were obliterated from sight by salvos, but presently their bow waves would appear again and they would emerge, only to be blotted out once more a moment later."

Petard and *Turbulent* were under the fire of German destroyers at close range and of battle cruisers at 7,000 yards for a considerable period without being hit.

Nerissa and *Termagant* were under fire of German destroyers and *Regensburg* for about 10 minutes at 5,000 yards range. They were also within 7,000 yards of the battle cruisers, but it is not stated whether or not they were under their fire. Neither vessel was hit.

Obdurate was engaged with destroyers and the *Regensburg* for about 10 minutes at ranges from 6,000 to 3,000 yards. She received two 4.1-inch hits from destroyers.

Morris engaged the German destroyers without being hit.

Narborough and *Pelican* were about 8,000 yards from the German battle cruisers, but apparently were not under any gunfire.

B. Attack of "Onslow" and "Moresby" at 5.10 p. m.

Onslow and *Moresby* came under the very heavy fire of four light cruisers and possibly battle cruisers for about 10 minutes at approximately 7,000 yards range. The *Moresby* reports: "The enemy shooting was very good and had they fired double salvos they would have hit. By observing attentively and using large helm, the ship was not straddled more than six times and only one piece of H. E. was picked up. The enemy ships appeared not to fire after a certain bearing, but the fresh ship starting seemed to straddle with almost the first salvo, though not again. The deflection was often too much, and simple use of helm avoided the following salvo, which would have hit." Neither of the destroyers were hit.

Of the 12 destroyers which had been under heavy fire of destroyers, battle cruisers, battleships, and light cruisers during these two attacks at ranges from 7,000 to 3,000 yards, the following hits, excluding those on the *Nestor* and *Nomad* after they had been crippled, were made:

Nestor, two hits, by light cruiser.
Nomad, two hits, by battle cruiser.
Moorsom, one hit, by destroyer.
Obdurate, two hits, by destroyer.

C. Attack of German Destroyers at 4.30 p. m.

This attack was made by 15 destroyers—one and one half flotillas—supported by the *Regensburg*, and also to some extent by the secondary gunfire of the battle cruisers. These destroyers came under the fire of 12 British destroyers at ranges as low as 1,000 yards, from the *Nottingham* at about 8,000 yards, and from the secondary batteries of the *Tiger* and *Princess Royal* at about 11,000 yards: it is possible that other vessels of the Battle Cruiser Fleet also fired. As a result of this fire one destroyer was sunk—probably by British

destroyers. Another was sunk by the tordepo fire of the *Petard*. It is possible that several others were hit but not seriously damaged.

D. Attack of the "Onslow" at 6 p. m.

The *Onslow* engaged the *Wiesbaden* for about 10 minutes at ranges between 4,000 and 2,000 yards. Although the *Wiesbaden* was badly crippled at this time, at least one 6-inch gun and probably more were still in action. The *Onslow*, however, was not hit by her fire. The *Onslow* then closed to within 8,000 yards of the leading German battle cruiser, which hit her amidships with one heavy shell. The ship then retired, passing within 3,500 yards of the *Wiesbaden* without being hit. The commanding officer next closed to within 8,000 yards of the German battle fleet and was finally hit by two more shells, probably of medium caliber, which put the ship out of action.

E. Attack of "Shark," "Acasta," "Ophelia," and "Christopher" at 6 p. m.

At about 6 p. m. the above four destroyers, then accompanying the Third Battle Cruiser Squadron, became engaged with the light cruiser *Regensburg* and the 10 large destroyers of Flotilla II. After about 10 minutes of firing, which commenced at about 5,000 yards range, the *Shark* was hit from 5 to 10 times by destroyers and badly damaged. A German destroyer—probably *B–110*—then closed the range to 1,500 yards, made more gunfire hits, and sank her with a torpedo which hit amidships.

The *Acasta* was twice hit by the *Regensburg* or destroyers and apparently retired for the time. She appears, however, to have turned back again and reached a firing position 4,500 yards from the leading German battle cruiser. The *Regensburg* then made three more hits and put her definitely out of action.

The *Ophelia* and *Christopher* apparently kept at greater ranges and were not hit, although at times under a very accurate fire.

F. Attack of Flotillas II and IX and the Twelfth Half Flotilla at 6 p. m.

While the *Regensburg* and Flotilla II were engaged with the *Shark* and other British destroyers, Flotilla IX and the Twelfth Half Flotilla pushed through the smoke screen they had made to cover Scouting Division II from the Third Battle Cruiser Squadron in order to make a torpedo attack on that force, which they believed to be the British Battle Fleet. Although these destroyers penetrated to within 6,500 yards of the battle cruisers, their official reports do not mention any fire at destroyers and show no expenditure of secondary battery ammunition. On the other hand, the Germans state that they were under a heavy fire, which was apparently meant for

the light cruisers. It is believed that the German destroyers received no hits at this time.

G. Attack of Flotilla III at 6.35 p. m.

In order to cover the retiring German Battle Fleet, Flotilla III advanced within the lines and laid a smoke screen. Three destroyers—*V–73*, *G–88*, and *S–32*—advanced beyond the screen and fired torpedoes at a range of 8,000 yards. These vessels came under the following fire:

TABLE 3.—*Fire at Flotilla III between 6.35 and 6.45 p. m.*

Firing ship.	Time.	Range.	Guns firing.	Rounds.
Agincourt	6.40	8,000	4-inch	35.
Tiger	6.36	8,000	6-inch	15.
Barham	6.40	8,000	do	Unknown.
Princess R	6.36	8,000	do	Do.

As these vessels were generally scattered through the British battle line, it would appear that the attacking boats were not noticed by many vessels. It is not believed that they came under a very heavy fire. Admiral Scheer states that *V–48* was sunk at this time, but all the British accounts indicate that this destroyer was sunk later in a subsequent attack by Flotilla III. It is not believed that any destroyers were hit.

H. The Great Attack from 7.10 to 7.40 p. m.

It is rather difficult to reconcile the British and German accounts of this attack; the following seems the most probable course of events:

(*a*) The first attack consisted of the Eleventh and Seventeenth Half Flotillas on an easterly course and the *V–73*, *G–88*, and another boat of the Third Flotilla on a northerly course toward the Wiesbaden; this gave a total of 13 boats. Fire was opened on them at about 7.10 p. m. and continued until about 7.25, when they fired torpedoes and disappeared behind a smoke screen.

(*b*) The second attack was probably made by eight boats of Flotilla III, which had attacked already at 6.35 p. m. Fire was opened on this flotilla at about 7.22 and continued to about 7.30. Only one boat saw the British battleships and fired a torpedo.

(*c*) The third attack was made by Flotilla V. It came under the fire of light cruisers and a few ships of the battle fleet at about 7.30 and continued to be under fire until about 7.45. It did not sight the British battle fleet and fired no torpedoes at it.

The following fire of capital ships was directed at the German destroyers:

TABLE 4.—*Fire at Flotillas III and V and Eleventh and Seventeenth Half Flotillas between 7.10 and 7.45 p. m.*

Firing ship.	Times.	Range.	Main battery rounds.	Second battery rounds.	Remarks.
Iron Duke	7.11: 7.24	9,000	5	50	
Marlborough	7.22	8,000	5	60	
Hercules	7.31	6,000	12	.....	
Colossus	7.05: 7.10	4,000	28	10	
Revenge	7.22	8,000	.....	87	
Neptune	7.10	8,000	4	48	
Agincourt	7.18	8,000	.....	105	
Royal Oak	7.09	9,000	.....	84	
Conqueror	7.12: 7.25	10,000	40	.....	
Benbow	7.09: 7.35	8,000	.....	? 120	25 minutes shoot.
Bellerophon	7.09	8,000	? 6	? 50	8 minutes shoot.
Canada	7.15	8,000	Unknown.	Unknown.	
Canada	7.25: 7.30	8,000	15	30	3 salvoes, 14-inch.
Vanguard	7.20: 7.25	8,200	8	10	
Temeraire	7.30	9,000	12	40	
Tiger	7.27: 7.36	8,000	.....	? 45	6 minutes shoot.
New Zealand	7.28	.....	8	.....	
Valiant	7.28: 7.35	8,000	.....	92	
Malaya	7.25	8,000	8	? 50	2 guns—15 minutes.
Totals approximate only	.....	.....	151	887	

Only two German destroyers were sunk by this great volume of fire; one of these was *S–35*; as this vessel belonged to the Seventeenth Half Flotilla, which commenced its attack about 7.10 p. m., it is probably the destroyer which the *Neptune* claims to have hit with a 12-inch shell and sunk at 7.15 p. m. This agrees with the statement of Admiral Scheer. The *V–48* was the other boat lost. It belonged to Flotilla III, which started to come under fire about 7.22. It is very difficult to determine from British accounts how this vessel was sunk, but it seems possible that she was the destroyer seen by the *Bellerophon* to be hit with a 12-inch shell at 7.26: she was probably crippled by this projectile and later sunk by the first division of the Twelth Flotilla, which claims to have sunk a destroyer of the V class at 7.50.

In a letter to the writer, Commander Groos, the German official historian, stated that six German destroyers had been injured in the battle. Of these, *S–32* and *G–40* were hit during the night, and one boat of Flotilla II was hit by the Second Light Cruiser Squadron at about 8.30 p. m. This makes it probable that three were hit in the great attack. These were possibly—

(*a*) The leading boat of Flotilla III, which the Fourth Light Cruiser Squadron claims to have sunk at 7.22 p. m.

(*b*) A destroyer of either the Eleventh or Seventeenth Half Flotillas which the *Agincourt* claims to have hit with five 6-inch at 7.18 p. m.

(*c*) A destroyer of either the Eleventh or Seventeenth Half Flotillas which the *Iron Duke* claims to have hit with four 6-inch at about 7.13.

I. Isolated German Attacks Between 8 and 9 p. m.

As it began to get dark and the High Fleet started its run to the southward, the Twelfth Half Flotilla and Flotilla II made some half-hearted advances. At 8.18 the Fourth Light Cruiser Squadron opened fire upon and drove off the Twelfth Half Flotilla, apparently without making any hits. At 8.30 and again at 9 the Second Light Cruiser Squadron fired upon and drove off to the northward Flotilla II. On one occasion several hits were made on a destroyer amidships. The *Beaubow* fired at this flotilla for a time.

In addition to the gunfire directed at destroyers, there were a number of cases where these vessels accompanying battle cruisers or battleships came under very heavy fire which was directed at the capital ships. The *Liberty* reports that about 4 p. m. "a very heavy fire was experienced from the 'shorts' of the enemy battle cruisers, but *Liberty* was only hit by splinters and no damage was done." At this time the *Liberty* was 1,000 yards on the engaged beam of the battle cruisers. No destroyers were hit at this time.

All during the run to the northward from 4.50 p. m. on shells were falling in the vicinity of the destroyers which were accompanying the Fifth Battle Squadron. During a part of the time the destroyers with the Battle Cruiser Fleet were under a similar fire. No hits were made.

But the worst concentration on the British destroyers occurred when the Battle Cruiser Fleet met the Battle Fleet at about 6 p. m. Here a great number of destroyers were mixed up and bunched in a small area and came under a very heavy fire. "The enemy's projectiles," reports the *Attack*, "were falling amongst this mass of T. B. D.'s, and it was remarkable that no one except the *Defender* appeared to be seriously damaged." An officer of the *Faulknor* makes the following report: "All the time overs and ricochets from the German heavy ships were falling in the midst of our bunched flotilla, so that it was no pleasant situation for us; yet, miraculous though it seemed, not one ship during this period was hit by even a splinter." This statement apparently refers only to the Twelfth Flotilla. The *Defender* was hit by a ricochet 12-inch shell and her

speed reduced to 15 knots. The *Marvel* was hit by a 12-inch shell, which did no apparent damage. The *Attack* was hit by the nose of a 11-inch shell which fell into the wardroom.

At 8.20 p. m. the *Attack* reports that there were a "great number of enemy's overs falling amongst First Flotilla, small splinters striking *Attack*."

The one striking fact in the above detailed statement of the results of gunfire on destroyers during daylight is the great difficulty of hitting destroyers either with the main and secondary batteries of capital ships or the batteries of light cruisers and destroyers. This might be expected in an attack where the attacking boats were covered by the fire of their own capital ships; but it also appears to be true even where the vessels firing on the destroyers were not under fire themselves and were working under target practice conditions.

The following table summarizes the results of gunfire on destroyers by day:

TABLE 5.—*Destroyers sunk, put out of action, or hit by gunfire.*

Destroyer.	Result of fire.	Firing ship.	Battery.	Remarks.
Nestor	Out of action	Light cruiser	4.1 inches	Later sunk by battleship.
Nomad	do	Battle cruiser	5.9 inches	Do.
Moorsom	Hit—slight damage	Destroyer	4.1 inches	Continued in action.
Obdurate	do	do	do	Do.
Onslow	Out of action	Battle cruiser	12.2 inches	Towed into port.
Shark	do	Destroyer	4.1 inches	Sunk later by torpedo.
Acasta	do	Light cruiser	do	Towed for a time.
Defender	do	Battle cruiser	12.2 inches	Able to make 15 knots.
Marvel	Hit—no damage	do	do	Continued in action.
Attack	Hit by nose of shell	do	11 inches	Do.
V-29	Sunk	Destroyer	4.7 inches	Sank immediately.
S-35	do	Battleship	12 inches	Do.
V-48	Out of action	do	do	Sunk by destroyers.
Destroyer	Hit—little damage	Light cruiser	6 inches	Continued in action.
Do	do	Battleship	do	Do.
Do	do	do	do	Do.

In the above 16 cases the firing ship in 5 cases was a battle cruiser, in 4 cases a battleship, in 3 cases a light cruiser, and 4 cases a destroyer. It is thus evident that the gunfire of all these four classes of ships will be about equally effective on destroyers.

It is an important fact that no destroyer was sunk before being able to fire all its undamaged torpedoes at short range; in only a few cases were torpedoes damaged by gunfire before they could be fired.

It follows from the above that all classes of ships should be trained in gunfire at destroyers with both main and secondary batteries. The experimental practice at a target towed at 25 knots recom-

mended above for the purpose of developing the methods of controlling gunfire at light cruisers will be equally effective for gunfire at destroyers during daylight.

IV. RESULTS OF GUNFIRE OF BATTLESHIPS, BATTLE CRUISERS, LIGHT CRUISERS, AND DESTROYERS AGAINST DESTROYERS DURING DARKNESS.

These results may be summarized in the following table:

TABLE 6.—*Results of gunfire of battleships, battle cruisers, light cruisers, and destroyers at destroyers during darkness.*

Destroyer under fire.	Firing ship.	Range.	Number of hits.	Minutes under fire.	Remarks.
Broke	Westfalen	800	Two 11-inch; 8 6-inch	2	Out of action.
Do	Destroyer	400	Two 4.1-inch	1	Slight damage.
Garland	Light cruiser	800	One 6-inch	2	No damage.
Do	Battleship	500	None	2	No hits; straddled.
Spitfire	Light cruiser	700	Five 6-inch (?)	3	Slight damage.
Do	Nassau	000	Two 6-inch	2	Out of action; collision.
Sparrowhawk	Light cruiser	700	None	2	No hits.
Do	Battleship	800	....do	2	Do.
Tipperary	3 light cruisers	800	Very many	1	About 12 salvos; sunk.
Fortune	Light cruiser	800	....do	2	Sunk instantly.
Ardent	Elbing	800	Two 6-inch	1	Slight damage.
Do	Westfalen	500	Very many	3	Sunk instantly.
Turbulent	....do	200	....do	[1] 39	Sunk by one salvo.
Marne	Light cruiser	1,000	One 4.1-inch	2	Slight damage.
Petard	Westfalen and Nassau.	200	Six 6-inch	1	Slight damage; 3 salvos.
Obedient	Battleship	2,000	None	3	No hits.
Nessus	....do	2,000	One 6-inch	3	Slight damage; boiler hit.
Onslaught	Deutschland	2,000	....do	3	Out of action.
Maenad	Battleship	2,000	None	3	No hits.
Porpoise	Light cruiser	800	Two 6-inch	3	Out of action.
Faulknor	....do	2,000	None	3	No hits.
S-32	Castor	2,000	One 6-inch	1	Out of action.
G-40	Champion and 2DD.	3,000	....do	2	Do.

[1] Seconds.

In weighing the results of gunfire as shown by this table the following facts should be taken into consideration:

(*a*) German gunnery at night was of an extremely high order. "The German organization at night," reports the British commander in chief, "is very good. Their system of recognition signals is excellent. Ours is practically nil. Their searchlights are superior to ours, and they use them with great effect. Finally, their method of firing at night gives excellent results. I am reluctantly compelled to the opinion that under night conditions we have a great deal to

learn from them." This statement is supported by all the British official reports and accounts of the battle.

(*b*) The night was very dark, and in addition there was considerable mist, to such an extent that had it been light the visibility would have been about 3–5 miles. This allowed destroyers to get somewhat closer to enemy ships before being detected than would usually be the case.

(*c*) The table is composed only of cases where ships were damaged or a particularly heavy fire was directed at them. In many additional cases ships were under fire, but did not mention this fact because no hits were received. Accounts are available from but 4 destroyers of the 16 which composed the Twelfth Flotilla; at least 9 of these boats, and probably more, were under fire.

The following conclusions are presented from a consideration of the table and the above facts:

(a) Night gunfire on destroyers will be of short duration and will seldom exceed 2 minutes.

(b) When the firing range is point blank—i. e., from zero to 800 yards—there is one chance in four of the destroyer being sunk; two chances in four of its being put out of action or sunk; three chances out of four that it will be either hit, put out of action, or sunk; and one chance in four that it will not be hit at all. This is taken directly from the table.

(c) When the firing range is from 1,500 to 3,000 yards, there is practically no chance of the destroyer being sunk, about one chance in seven of its being put out of action, and about one out of four that it will be either hit or put out of action. This is taken partly from the table and partly from a knowledge of the number of boats under fire which did not submit reports.

(d) When it is remembered that there was almost no case where the same ship shifted fire from one destroyer to another, it will be realized that when the number of attacking destroyers is greater than the number of vessels in their torpedo target, which will usually be the case, many vessels in the attacking group will never be under fire.

(e) There was no case, as far as has been covered by reports, where a destroyer was sunk or put out of action before being able to fire all its torpedoes. This was true even in the case of the "Tipperary" and "Broke," which were put out of action by the first salvo fired at them.

The comparatively ineffective fire of the Germans demonstrates the great difficulty of hitting destroyers at night and the necessity of giving this subject our most earnest consideration.

In fire at short range the correct range and deflection are of secondary importance; our real problem is to get guns and searchlights trained on the target immediately. The searchlight is the thing for

short-range work, and its development and control are matters of the first importance.

All classes of surface craft must be used in beating off the night attacks of destroyers and, in addition to capital ships, our light cruisers and destroyers must be particularly proficient in this form of gunnery.

There are three conditions which should exist in night gunnery exercises as destroyer targets:

(a) The range should be point blank, between 1,000 and 500 yards.

(b) The rate of change must be very great.

(c) The bearing of the target must change rapidly.

These conditions suggest a practice in which a firing ship steams at maximum speed past a large target towed on a parallel and opposite course so as to be about 800 yards distant when abeam. The target should represent the midships portion of a destroyer—which, as will be shown later, is the most favorable point of aim—and the time from the order to turn on searchlight to cease firing should not exceed two minutes. The towing ship possibly runs some slight risk of being fired at through error, but this possibility can be reduced by having it brightly illuminated, by using an extra long tow line, and placing check telescope observers at all guns.

V. RESULTS OF THE GUNFIRE OF LIGHT CRUISERS ON BATTLESHIPS, BATTLE CRUISERS, AND LIGHT CRUISERS.

While a considerable portion of the gunfire of light cruisers was directed at destroyers, as has been already discussed, there were a number of instances, both during the day and night actions, in which light cruisers engaged each other and, on one occasion, enemy battle cruisers.

The gunfire of light cruisers, and in particular those of the High Sea Fleet, was very accurate, and in this respect confirmed the results of the Helgoland Bight action. The *Canterbury*, for instance, states that the salvoes of the German light cruisers fell within a space of 30 yards and that the fire was very rapid. The fire of the *Frankfurt* on the *Chester* was remarkably fine. The range at opening fire was about 7,000 yards, and as the two vessels were approaching on opposite courses the rate of change was very great. "The enemy's first salvo," writes an officer of the *Chester*, "fell a good 2,000 yards beyond us, the second from 500 to 700 yards short, and then most of the third came on board—a very fine bit of target finding one must admit."

An unusual incident was the fire of the *Falmouth* and *Yarmouth* at the *Lutzow*. This is well described by an officer of the *Yarmouth:*

"Hoping to close the enemy light cruisers, we drew ahead of *Inflexible* and *Indomitable*, but our opponents turned away to starboard, and we shifted fire onto the leading German battle cruiser. She was a topping target, and it was very pleasant to see salvo after salvo of our 6-inch hitting her, which must have considerably worried their bridge and personnel on the upper deck, and perhaps accounted for the poor reply which they made to our fire with their 5.9-inch guns."

TABLE 7.—*Results of gunfire of light cruisers at battleships, battle cruisers, and light cruisers.*

Firing ship.	Target ship.	Range.	Time (minutes.)	Effect of fire.
		Daylight firing.		
Falmouth	Wiesbaden	9,700-4,000	10	Not known; probably no hits.
Do.	Lutzow	5,200-6,100	5	Probably several hits.
Yarmouth	....do	5,200-6,100	5	Probably 5 to 10 hits.
Third Light Cruiser Squadron (4).	Scouting Division IV (5).	9,600-6,000	5	No hits; visibility very poor.
Scouting Division IV (5).	Third Light Cruiser Squadron (4).	9,600-6,000	5	Do.
Falmouth	Frankfurt	6,000	5	Possibly two hits; visibility poor.
Chester	....do	7,000-5,600	19	No hits; damaged before opening fire.
Scouting Division II (4 ships).	Chester	7,000-5,600	19	Approximately 20 hits.
Frankfurt (?)	Galatea	15,000	5	1 hit.
Canterbury	Frankfurt	10,000	10	Possibly 2 hits; fired 75 shots.
Active	Wiesbaden	10,000	2	2 salvos; both fell short.
Pillau (?)	Warrior	10,000	5	About 4 hits; fine shooting.
		Night firing.		
Castor	Frankfurt (?)	1,500	5	2 hits possible; target uncertain.
Frankfurt (?)	Castor	1,500	5	10 hits.
Second Light Cruiser Squadron (4).	Scouting Division IV (5).	1,500	4	11 hits on 3 ships.
Scouting Division IV (5).	Second Light Cruiser Squadron (4).	1,500	4	33 hits on 2 ships.

The table demonstrates the following facts:

(a) In a day action in which all classes of ships are engaged or in any form of a night action the duration of a light cruiser's shoot at one target will be usually about five minutes. Rapidity in training on targets and getting the inital range is therefore particularly important.

(b) When light cruisers are alone engaged in a day action in good visibility, the shoots will usually be of a much longer duration, as in the fight of Scouting Division II with the "Chester," which lasted 19 minutes.

(c) The usual range in a day action will be from 6,000 to 10,000 yards. The hitting of the "Galatea" by the "Frankfurt" or another cruiser of

Scouting Division II with 5.9-inch guns at 15,000 yards was an example of wonderful shooting, but it was hardly worth the expenditure of ammunition as far as the actual material damage was concerned.

(d) The night firing range will usually be from 1,000 to 2,000 yards.

The following recommendations are presented:

(*a*) *That the long-range battle practice for light cruisers require a shoot of about four minutes in which the range decreases from 10,000 to 6,000 yards. The target should preferably be one which can be towed by a destroyer at 25 knots on a zigzag course. An experimental practice under similar conditions except with low visibility or with the target emerging from a smoke screen would be desirable.*

(*b*) *That a day experimental practice of about 10 minutes duration be fired by one light cruiser; the target to be towed at 25 knots on a zigzag course; fire to be commenced at 10,000 yards; the range to be decreased to 5,000 yards and then increased to 10,000 at the end of the practice.*

(*c*) *That night battle practice be fired at a towed target, which will be passed at a range of 1,500 yards when abeam; two runs to be made, one on a parallel course in the same direction and one in an opposite direction. The firing ship to make maximum speed. The time allowed to be two minutes from the order to turn on searchlights.*

VI. RESULTS OF THE GUNFIRE OF DESTROYERS ON BATTLESHIPS, BATTLE CRUISERS, AND LIGHT CRUISERS.

The use of destroyer gunfire on larger ships was one of the unexpected developments of the battle.

The *Onslow* took advantage of the damaged condition of the *Wiesbaden* to commence firing at her at 4,000 yards and continued until the range had decreased to only 1,900 yards. In all 58 rounds were fired and a number of hits were claimed. The *Nestor* and *Nicator* also engaged the *Regensburg*, but probably did not make hits. The *Shark* also probably fired at the *Regensburg*. The British destroyers, which attacked at 4.30 p. m., fired at the German battle cruisers with considerable effect. Von Hase states that their 4-inch shells brought down the radio antennæ of the *Derfflinger* and cut several fire-control telephone leads. The *Derfflinger* received nine minor caliber hits and the *Seydlitz* two, and probably all these were made by the British destroyers in this attack.

During the night the attacking British destroyers fired with considerable results on the German battleships and light cruisers, as shown by the table which follows.

TABLE 8.—*Hits on German ships made by British destroyers during night attacks.*

Ship hit.	Number of hits.	Casualties.	Material damage.
Oldenburg	1	20	Unknown.
Rheinland	2	26	Searchlight destroyed.
Nassau	2	25	All searchlights on engaged side put out of action by cutting of distant control cable.
Westfalen	2	10	Unknown.
Light cruiser	1	.....	Searchlight destroyed.

The use of gunfire against the target ship should be made a part of our destroyer doctrine, because of the considerable material damage and personnel losses inflicted and also of the moral advantage of keeping our own destroyer crews occupied during their approach under heavy gunfire to torpedo range. The sound of our guns is undoubtedly an encouragement.

VII. THE EFFECT OF VISIBILITY ON GUNFIRE.

The Battle of Coronel brought out clearly the advantage of having the visibility conditions in our favor. The Battle of Jutland confirmed it. There is no doubt but that visibility will be one of the most important factors affecting a future fleet action. At this time we will consider merely the atmospheric conditions; the effect of smoke and smoke screens will be considered later.

In the battle-cruiser action, while both forces were running to the southward, it is generally admitted that the visibility was good and that the atmospheric conditions conferred no advantage on either the British or the Germans. As soon, however, as the action recommenced on a northerly course the visibility became poorer and gave the Germans quite an advantage. Admiral Beatty states these conditions as follows: "Up to 6 p. m. the weather conditions were wholly in favor of the enemy. The horizon to the eastward was entirely obscured by haze, and from the Fifth Battle Squadron when engaging the enemy battleships and battle cruisers only the flashes of enemy guns could be made out. On the other hand, a strong light to the westward enabled the British ships to be distinguished clearly by the enemy." He supports the last sentence by a photograph in which British destroyers were clearly seen against the bright horizon to the westward for at least 8 miles.

After 6 p. m. the visibility became very low and gave the British a moderate advantage up to 6.45; after this it gave the British an advantage which was absolutely decisive and which in itself would have prevented the Germans from winning.

Regarding the conditions at about 7.15 Admiral Scheer states: "The fire directed against our line was mainly concentrated on the battle cruisers and Division V. These ships suffered very severely, as they were able to distinguish little more of the enemy than the flashes of his salvos, whereas they themselves apparently offered good targets." Von Hase also states: "Practically nothing could be seen of the British ships from the *Derfflinger*, though their position was revealed by the great golden-red flashes from their guns."

This is confirmed from British sources. The *Iron Duke* reports: "The enemy was lit up by the sun, whereas *Iron Duke* was probably invisible to them in the mist." Admiral Jellicoe reports: "The fact that the gunnery of the German battle fleet when engaged with our battle fleet did not show the same accuracy must not, I think, be taken as showing that the standard is not so high as with their battle cruisers, as I am inclined to the opinion that we then had some advantage in the way of light, although it was very bad for both sides." Despite the fact that the British had a great advantage, the low visibility greatly interfered with their fire also, as is shown by the 13 instances of this in Table 1.

In the brief engagement at about 8.30 p. m. the advantage of the visibility was even more in favor of the British. "Only the flashes," reports Scheer, "of the enemy's salvos could be seen. The ships which were already severely damaged received further hits without being able to make any serious reply to the fire." The British do not claim any interference by low visibility during this engagement and even report seeing a number of hits. At the end they report that they lost the Germans in the mist, but this was probably because both British and Germans turned away and considerably increased the range.

The above facts clearly demonstrate the perhaps decisive advantage conferred by visibility conditions. A commander should realize that they may well multiply or divide his hitting power by two and even temporarily make his gunfire totally ineffective. The visibility conditions should be given full weight in his decision as to whether or not he should engage, and naturally every effort should be made to obtain favorable conditions, as Von Spee did to such good effect at Coronel and as Jellicoe did at Jutland.

The importance of visibility conditions might be emphasized by assigning heavy penalties in tactical problems played at the War College and by changing the visibility conditions during a problem. Special problems might be played in which over half of the ships in one formation, selected at random, would be declared covered by mist for one or more moves, the ships selected being changed from move to move. This will also bring out the necessity for shifting fire correctly and rapidly from one target to another.

VIII. EFFECT OF SMOKE ON GUNFIRE.

At this time the important question of smoke screens will not be considered, as it will be taken up later under the general heading of tactics. Here the effect of smoke which was not deliberately made by the enemy or our own forces will be examined. Such smoke was formed in the following ways:

(*a*) By boiler gases leaving the funnels.
(*b*) By powder gases expelled from guns.
(*c*) By fires on our own or enemy ships.
(*d*) By shells striking short and bursting.
(*e*) By the explosion of the powder magazine of ships.

Some illustrations of the great number of cases where ships suffered smoke interference will be included in the following table. In most cases where a particular ship reported smoke interference, all the ships near her in formation were subjected to the same interference.

TABLE 9.—*Instances of effect of smoke on gunfire.*

Firing ship.	Cause of smoke.	Ship interfering.	Effects of interference.
Lion	Shells	Scouting Division I	Considerable interference.
Tiger	do	do	Interference.
Marlborough	Fire	Wiesbaden	Ceased fire when hitting.
Lion	Funnels	Leydiard and Lan Irail	Considerable inconvenience.
Tiger	do	do	Considerable interference.
Princess Royal	do	do	Spotting became difficult.
Iron Duke	do	Duke of Edinburgh	Obscured every thing on firing side.
King George V	do	do	Fire much hampered.
Erin	do	do	Second Battle Squadron's view of enemy obscured.
Agincourt	do	British destroyers	Line of fire blocked.
King George V	Gunfire	British cruisers and battle cruisers.	Fire much hampered.
Do	Funnels	British destroyers and light cruisers.	Do.
Benbow	Fire	Wiesbaden	Target obscured.
Barham	Funnels	Battleships ahead	Range partly obscured.
Do	Gunfire	do	Spotting was very difficult.
Valiant	Funnels	Battle Cruiser Fleet	Obscured the target.
Do	Explosion	Defense	Do
Do	Fire	Warrior	Do
Birmingham	Funnels	Three light cruisers ahead	Impossible to see anything.

Of these 19 cases there were only 4 where the interference was caused by the enemy: of these 2 were caused by shells falling short and 2 by a fire on the *Wiesbaden*. In no case did the smoke from funnels or guns of German ships interfere with the British fire. The wind was from the unengaged side of the German battle line.

In only two cases was interference caused by the smoke of ships ahead and in the same formation. This was probably due to the fact that the wind was on the engaged side. In nearly every case the interference was caused by units or individual ships getting between the firing lines. The Battle Cruiser Fleet and the First Cruiser Squadron are notable examples, but the *Duke of Edinburgh* interfered with nearly the entire battle fleet, laying what practically amounted to a long screen of dense smoke between the lines.

Smoke interference will probably not be so serious in future fleet actions, because now nearly all first-line vessels are oil burning. This, however, will assist in the deliberate laying of smoke screens.

In tactical games units which steam between the lines at high speed should be considered to lay a thin smoke screen, which reduces the effectiveness of gunfire.

IX. EFFECTIVENESS OF RANGE FINDERS.

In general, range finders have two uses in fire control—

(*a*) To obtain the initial range.

(*b*) To determine the rate of change of range by a series of readings.

Table 1 shows that in only one certain case was the target hit on the first salvo. This was a notable feat in range finding. The *Invincible* appeared suddenly into view with fair visibility conditions; a range of 9,000 meters was quickly taken and two shots of the first salvo hit. As in general it required three salvos to get onto the target, it is evident that all we may expect from our range finders is an approximate initial range so that the first salvo will fall moderately close to the target. This is all we require, however, as even if the actual range could be measured exactly, the difficulty of estimating the ballistic correction is so great that we could not expect to hit with the first salvo.

In general, during the early part of the action, when the visibility was good, fair initial ranges were obtained. There were, however, a number of instances even under these conditions of very poor range taking. Thus the *Lion* made the opening range 18,500, while that taken by the *Princess Royal* was 16,000. The *Lion's* range was much too great, as no shorts were obtained until the fourth salvo. The *Tiger* also opened with 18,500 yards on the sights, but this was far too great, as in four minutes it was brought down 4,600 yards, only about 2,000 yards of which can be accounted for by the prevailing rate of change. The *New Zealand* opened with 18,100, and in one minute brought this down 2,300 yards, and in three minutes no less than 5,600 yards. On the German side, Von Hase admits that his

range takers were rattled and were out probably 800 yards; the *Tiger* states that the first salvo fired at her fell about 2,000 yards short. A little later the *Valiant* opened fire on an estimated range, as no range-finder range could be obtained.

During the action between the battle fleets, which commenced about 6 p. m., the visibility became so low that it was generally very difficult to obtain even initial ranges. The *Marlborough*, *Valiant*, *Princess Royal*, *New Zealand*, and *Superb* all had to open fire at estimated ranges. In a number of cases where data is available it is noted that the initial range had to be radically altered, therefore showing that the ship opened fire on an estimated range or the range-finder range was very much in error. Thus at 8.18 p. m. the *Princess Royal* came down 3,000 yards in 2½ minutes; at 7.19 the *Hercules* spotted down 1,600 and claims a hit; at 7.05 the *Revenge* spotted down 800 to get a straddle; at 6.23 the *Tiger* reported that the gun range differed by 1,500 yards from that obtained by the range finder. The *Erin* states that the ranges were of no value and the *Malaya* and *Bellerophon* that only a few ranges could be obtained. On the other hand, there is evidence that range finders were of value to obtain the initial range. The *St. Vincent*, *Benbow*, and *Thunderer* report that on four occasions they were able to obtain initial ranges. The *Thunderer* makes the following statement: "Objects came into view and disappeared again in about three minutes, and a quick range-finder reading, used immediately, was the only practicable method. Most of the ranges taken were about 11,000 yards, but for a short period ranges 22,000 to 18,000 were obtained from the foretop." The *Valiant* reports that while range finding was "extremely difficult except at the commencement," nevertheless the range finders "were a very great help." The *Iron Duke* reports: "The range finders obtained very good results, notwithstanding the bad light, and were of the greatest assistance in keeping the range."

During the battle cruiser action apparently most of the ships engaged were able to use their range finders with fair effect for obtaining the rate of change. The gunnery reports of the *Tiger*, *Princess Royal*, and *New Zealand* show that they were able to get a fairly steady series of ranges during the times they were firing; the other battle cruisers were probably able to do the same. The *Malaya* reports having made a continuous plot for 33 minutes at the beginning of the action; Von Hase states that his range takers never varied from each other by more than 300 meters during the entire action and is greatly pleased with their work; nevertheless he admits that the high rate of change and the changes of course of the *Derfflinger* during his shoot at the *Princess Royal* from 4.27 to

4.33 greatly decreased the effectiveness of his fire; that he did not get his rate of change correctly is shown by the fact that he had to give up spots of 1,400 meters during this six-minute period. The *Tiger*, in a long series of ranges throughout the entire action, reports that on five occasions the ranges by range finder and on the sights were approximately the same.

During the low visibility of the battle fleet action it was of course very difficult to obtain a series of ranges long enough to get the correct rate of change. The *St. Vincent* states that from 6.54 to 7.26 she was able to hold the target closely and that her range finders agreed well. This resulted from the fact that in all this 23-minute period the range lay between 10,000 and 9,500, and the good judgment of her commanding officer, who, seeing the first two German ships covered with splashes, selected the third ship for his target. There is no other record during the battle fleet action where ranges were obtained in this way, although several ships report being able to get short series which may have been useful in fixing the rate of change, which very fortunately was during this period almost negligible whenever fire was possible. It must be realized, however, if low visibility hampers range finding, it also reduces the effectiveness of gunnery in many other ways—the difficulty of distinguishing friend from foe, the impossibility of distributing the fire of a unit by signal, and the difficulty of seeing the fall of the shot, thus making spotting often impossible.

In general the range finder demonstrated its value; but, as is usual in the case of a somewhat delicate instrument, there was great variation between the results obtained on different ships; while this in part might have been due to the fact that the visibility for some ships was worse than for others, it was probably due to varying degrees in the efficiency of the personnel operating the range finders.

The lesson for us is the great importance of adequate training of range-finder personnel, not only in good visibility, but particularly in hazy weather and when the target is covered with smoke. One excellent form of training would be for the towing ship in gunnery exercises to take ranges on the firing ship, or, if more than one ship is firing, on one of the rear ships which afford the most difficult conditions.

X. DISPERSION.

According to practically all reports the dispersion was very small. A few instances are given below as examples:

(*a*) Bellona states that German salvos "covered an extraordinary small area."

(*b*) *Valiant* reports that German salvos had "a very small spread of from 50 to 100 yards."

(*c*) *Princess Royal* reports that the spread of German salvos was very small.

(*d*) *Warrior* states that "calibration was very close indeed, about 75 yards spread usually."

(*e*) *Canterbury* says that the salvos of the German light cruisers fell "in a space of 30 yards."

(*f*) An officer of the *Nottingham* writes that the four-gun salvos of 12-inch and 11-inch fired by the German battleship invariably fell "all in a bunch."

(*g*) Admiral Jellicoe reports that the spread for "both direction and elevation is very small."

(*h*) The official report of the Austrian naval attaché in Germany describes the salvos of the British ships as follows: "Their patterns are absolutely and incredibly narrow and have caused general admiration. The spread was often only a few meters. Three shells of a four-gun salvo hit the *Koenig* between the capstan and the bridge." This comment applies principally to the firing of the Fifth Battle Squadron, as he states that the fire of the battle cruisers was "much worse."

The smallness of the dispersion brings up the much-debated point as to whether it is undesirable to reduce it beyond a certain limit. The possibility that too little dispersion is a disadvantage occurred to a number of officers who took part in the battle.

The *Warrior* reports as follows: "To the smallness of the spread is undoubtedly due the fact that the *Warrior* was not hit more often. The whole salvo missed as a rule. There was practically no spread for direction." The fact that whole salvos missed the vessels of the Second Light Cruiser Squadron by from 25 to 50 yards time after time when these vessels were zigzagging to avoid gunfire appears to support this opinion under the special conditions at that time. The Austrian naval attaché in commenting upon the British gunfire states: "Some think that these patterns are generally too narrow and that consequently it was too difficult to obtain a salvo which would cover the target." But he later says that the majority of the German officers thought that better calibration and smaller dispersion were necessary.

But if there is a possibility that in some cases the small dispersion of salvos was a disadvantage to the Germans, their salvos when they hit produced a terrific effect. As far as can be determined, the *Indefatigable*, *Queen Mary*, *Invincible*, and *Defense* were each hit by from two to four salvos in rapid succession immediately be-

fore their explosion. These salvos were of four guns, and in each case there were at least two hits and sometimes four; all the hits made by a particular salvo were in practically the same spot, and it would appear from the results that these concentrated salvos had an effect far and above that caused by the same number of hits made at different times and in widely separated parts of the target.

From a general consideration of these facts it is concluded that under all usual conditions the dispersion of salvos should be made as small as possible. In the special case where a capital ship is firing at a light cruiser at moderate ranges and the target is using zigzag tactics to avoid gunfire hits it would seem advisable to increase the dispersion so that it would be about 300 yards, if it should not naturally be as great as this.

XI. OVERCONCENTRATION.

The fire of the Grand Fleet at the *Wiesbaden* affords a notable example of the decrease in effectiveness in gunfire when a large number of ships are firing at the same target. This fact is noted in the reports of the *Bellerophon*, *Neptune*, *Thunderer*, and *Temeraire*. "This was," writes an officer of the *Bellerophon*, "as far as I know, the first concentration firing on a large scale which had ever taken place, and the results were naturally rather disappointing. The German cruiser was quickly hidden by a solid wall of splashes, except her bow which remained just visible, but she didn't seem to suffer much, and as none of us had the faintest idea as to which salvos were whose, fire control was rather hopeless." This condition partly accounts for the comparatively small number of hits received by the *Wiesbaden*.

On the other hand, the *Warrior* states that only three or four German ships were firing at her and the *Defense;* this fire was much more effective than that at the *Wiesbaden* under similar conditions.

XII. PERCENTAGE OF HITS WITH MAIN BATTERY GUNS.

As main-battery gunfire was used under a great variety of conditions in this action, the percentage of hits obtained will be a valuable guide as to what may be accomplished in the future under all the various conditions of visibility, at varying ranges, and at all kinds of targets.

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The numbers of main-battery hits—11-inch or greater—received by British and German ships are shown in the following table:

TABLE 10.—*Main-battery hits received.*

BRITISH SHIPS.			GERMAN SHIPS.		
Ship.	Hits.	Authority.	Ship.	Hits.	Authority.
Warspite	27	U. S. naval officer.	Derfflinger	19	Official.
Defense	8	Estimated—ship sunk.	Seydlitz	21	Do.
Invincible	8	Do.	Lutzow	20	Estimated—sunk.
Queen Mary	9	Do.	Moltke	4	Official.
Indefatigable	6	Do.	Koenig	10	Do.
Warrior	15	Official—probably more.	Markgraf	5	Do.
Colossus	3	"The Fighting at Jutland."	Kaiser	2	Do.
			Grosser Kurfurst	9	Do.
Calliope	1	Official.	Von der Tann	4	Do.
Black Prince	15	Very rough approximation.	Helgoland	1	Do.
			Holstein	1	Do.
Marvel	1	Official.	Pillau	1	Do.
Defender	1	Do.	Wiesbaden	11	Estimated.
Onslow	1	Do.	S-35	1	Official—sunk.
Attack	1	Do.	V-48	1	Do.
Broke	2	Do.			
Lion	12	Do.	Total	110	
Princess Royal	9	Do.			
Tiger	16	"The Fighting at Jutland."			
New Zealand	1	Official.			
Indomitable	1	Do.			
Barham	6	Do.			
Malaya	7	Do.			
Total	150				

In the above table the designation "Estimated" means that, as the ships in question were sunk, no official reports have stated the number of hits made, but that the number of hits has been estimated after a consideration of all available official and unofficial reports and is certainly not greatly in error. The number of hits assigned to the *Warspite* was reported by an officer of our service who later in the war lived for some time on the ship. The executive officer in his excellent report mentions about 21 hits from main-battery guns as having been seen by him during the action and indicates that there probably were other hits which did not at that time come to his attention. "At this time," he writes, "I thought our 6-inch were firing, but I realized afterwards it was only hits on us." The number of hits on the *Black Prince* is admittedly a mere guess, based upon the fact that she was sunk during the night by the fire of a large number of battleships at 1,500 yards' range.

As Admiral Scheer reports that the Germans fired 3,596 main-battery rounds during the battle, their percentage of hits was 4.1.

The British official report nowhere gives the total expenditure of main-battery ammunition, but there is included among the official dispatches a list of ammunition needed by each ship of the battle fleet to fill its ammunition allowance. There are also many references to ammunition expenditure among the official reports and the accounts in the "Fighting at Jutland." Quite an accurate estimate can therefore be made. The fire of the cruisers is not classed as main-battery gunfire; if this were included the percentage of hits would be reduced, as it is not probable that they made over two hits, and altogether they certainly fired over 100 rounds.

The following table shows the ammunition expenditure of the battleships and battle cruisers of the Grand Fleet:

TABLE 11.—*Main-battery ammunition expenditure.*

Ship.	A. P.	Lyddite.	Common.	Total.	Remarks.
Revenge	102	0	0	102	
Hercules	4	82	12	98	
Agincourt	144	0	0	144	
St. Vincent	88	0	8	96	
Colossus	81	0	12	93	
Collingwood	54	30	0	84	
Neptune	0	21	27	48	
King George V	0	0	9	9	
Orion	51	0	0	51	
Monarch	51	0	0	51	
Thunderer	0	0	35	35	
Conqueror	16	0	40	56	
Centurion	19	2	0	21	
Ajax	0	0	6	6	
Benbow	38	0	0	38	
Canada	42	0	0	42	
Bellerophon	41	0	21	62	
Vanguard	57	0	15	72	
Superb	0	38	16	54	
Temeraire	0	80	0	80	
Marlborough	138	24	0	162	
Iron Duke	0	0	90	90	
Royal Oak	.....	.....	.....	39	Kind of shell not reported.
Barham	135	0	200	335	
Valiant	289	0	10	299	
Malaya	.....	.....	.....	317	No report—Mean of Barham and Valiant.
Warspite	.....	.....	.....	317	Do.
Lion	321	0	0	321	
Princess Royal	.....	.....	.....	230	Kind of shell not reported.
Tiger	.....	.....	.....	304	Do.
New Zealand	170	170	76	416	
Indomitable	98	66	10	174	
Inflexible	10	19	58	87	
Indefatigable	.....	.....	.....	50	Estimated—Ship sunk.
Queen Mary	.....	.....	.....	100	Do.
Invincible	.....	.....	.....	60	Do.
Total	1,949	530	639	4,543	

The percentage of main battery hits for the British was 2.42.

These percentages of hits for both Germans and British are lower than the average naval officer, who bases his ideas on target practice conditions, would have thought possible. It should afford a vivid demonstration of the difficulties of gunfire in a fleet action and the necessity for getting to close range if a proper percentage of hits is to be made.

XIII. MISCELLANEOUS GUNNERY FEATURES.

It is an interesting fact that very few ricochet hits were received, and these did very little damage. The *Colossus* was hit a few feet above the water line by a 12-inch shell which struck close aboard. This shell is not reported as having done any damage and probably did not penetrate the armor belt. The *Falmouth* was not damaged by a 5.9 ricochet. The *Defender* was hit and badly damaged by a falling ricochet, which struck near one of the battle cruisers which the *Defender* was screening. These are the only cases of ricochet hits reported.

There was a fair amount of damage caused by shell fragments of shells bursting short, but nothing like the injuries reported from this cause in the Battle of the Sea of Japan. One shell, which hit about 30 yards short of the *Colossus*, did as much damage as another which made a direct hit. The gunnery control officer in the *Lion's* foretop states that fragments fell like hail on its splinter-proof armor. Other battle cruisers report a constant stream of fragments, but these did not appear to cause any important damage.

In quite a few cases ships were interfered with by the splashes of shell which fell short. This effect was noted particularly by the *Warspite* and *Warrior*. On the other hand, the *Valiant* reports that the German splashes were small and did not interfere with the fire control.

The *Lion* and several other battle cruisers report that their fire was inconvenienced by the smoke made by German shells bursting short.

All the above reasons emphasize the desirability of bringing the shots more in front of than over the target. This, of course, is a necessity for effective spotting.

The handling of searchlights in a night action is a difficult and most important subject. Since the invention of the star shell many officers have considered the searchlight obsolete. The Germans had star shells at Jutland, and for close range work they used their searchlights. It is to the effectiveness of their searchlights, not their star-shell work, that the British, from the commander in chief down, testify.

In addition to the value of searchlights for illumination, they have a distinct value as an offensive weapon for blinding the ship, fire and torpedo

parties of the target ship, as well as their gun and torpedo crews. This effect was noted in many reports and is well known in our service.

The following searchlight doctrine is recommended:

(*a*) *Star shells should be used for all long-range firing, as they do not establish the position of the firing ship.*

(*b*) *Searchlights should be used for short-range firing, as their illumination is much more positive and no guns have to be used for illuminating purposes, thus reducing the number of guns firing at the enemy.*

(*c*) *Searchlights should not be turned on a hostile vessel which we desire to engage or with which we are unable to avoid an engagement until she is well within searchlight range.*

(*d*) *It is undesirable to use more than one group of searchlights at a time, as this clearly defines the ship's position for gun and torpedo fire. In case a number of targets have to be illuminated, it may be necessary to use all the searchlights on the engaged side.*

(*e*) *Searchlights should be connected up with the broadside-gun directors for training, so that they will always be with the guns.*

(*f*) *Before turning on searchlights, both lights and guns should be brought to bear on the target. The orders to turn on and to open fire should be given simultaneously.*

(*g*) *If an enemy ship at which we desire to fire guns or torpedoes is already illuminated by the searchlights of another of our ships, searchlights should not be used, as they are unnecessary. The "Birmingham" and "Nottingham" fired very effectively this way, and did not receive a single hit in return.*

(*h*) *It is undesirable to use searchlights as a point of aim for gunfire; this blinds gun and director pointers and results in all the shots going high. As the range will be point-blank, the shots can not be spotted down enough to bring them on the hull of the ship unless a negative range scale were used. Most of the hits on the "Southampton" and "Dublin" were high, and most of the shots passed overhead. The masts and funnels were riddled.*

(*i*) *Every ship in the beam of an enemy's searchlight should turn its own searchlights on the target. If this is done, gunfire can be made very effective by selecting a point of aim in the enemy ship far enough away from its searchlights to bring them out of the fields of our gun and director telescopes, thus doing away with the blinding effect of the enemy's searchlights. The use of our searchlights is also of great assistance in determining the enemy's course and speed for the torpedo control parties. By holding your hand in front of your face to cover up the enemy's searchlights, the remainder of the enemy ship can be seen in the beam of our lights.*

Deflection is one of the most important items in fire control. Probably nearly as many salvoes missed for deflection as for range. In

particular, the *Valiant* reports that four consecutive salvoes fell 10 yards ahead of her stem, correct for range; the *Colossus* states that nearly all the enemy salvoes fell across her stem. A large proportion of the hits on the *Lutsow* and *Seydlitz* were well forward, and this seems to have been generally the case with other ships also. This result has been explained by the fact that the ship moves about one-third its length while the splash is rising and the spotter is making his estimate. In this way the splashes look to be in line with the foremast, when the shells actually passed the target ship in line with its stem. This error can be corrected by having the spotter alter the deflection so as to bring splashes in line with the mainmast instead of the foremast.

A special case where misses in deflection were frequent occurred when a light cruiser or destroyer was running directly away from the firing ship and maneuvering to avoid the salvoes. In this case the target ship might be outguessed by keeping the deflection steady for a time in the hope that the ship would zigzag into the salvoes or by introducing an artificial dispersion into the salvoes, so that they would have a wider spread in deflection; this would make the salvo cover a wider lateral zone and increase the difficulty of the target ship in trying to keep outside the salvoes.

In the battle-cruiser action and up to about 6 p. m. the fire distribution was regulated by signal, and there was little difficulty of keeping on the assigned target. However, when the visibility decreased and the battle fleets came into action any system of fire distribution became impossible. "Firing was general in the battle fleet, but the use of distribution of fire signals was out of the question, only three or four ships being in sight at a time from the van and center, although more were visible from the rear. Ships fired at what they could see, while they could see it." In only a few cases did this system result in any decrease of the effectiveness of gunfire.

All the British ships report that their directors were invaluable for keeping on the target, and that it would have been almost impossible to do any effective firing without them. This is one of the most important advantages of the director installation.

In all the German target practices before the war they had made a specialty of firing with very rapid and irregular rates of change. The comment of the Austrian naval attaché is very much to the point: "The Germans, on the contrary, in their target practice have always fired with great and sudden changes of range and in firing while altering their course; hence the fire-control parties feel that in this respect they have the advantage." This form of gunnery training went hand in hand with their remarkable tactical skill in making radical maneuvers with their entire fleet.

It is believed that we can follow the Germans to advantage in this respect. The battle showed that there are going to be many times when it will be necessary to fire with a rapid and irregular rate of change, and at least half our gunnery exercises should be carried out under these conditions. The question of tactical development will be taken up later.

PART II. THE EFFECTS OF GUNFIRE.

I. THE EFFECTS OF GUNFIRE ON BATTLESHIPS AND BATTLE CRUISERS.

Having examined the results of gunfire from the viewpoint of the firing ship, it will now be appropriate to examine the effects of this gunfire on the target ship.

TABLE 12.—*Hits on turret roofs.*

*Tiger*_____	11-inch shell, range 15,000, hit "Q" turret; shell did not penetrate; exploded outside; blew in pieces of roof, putting both guns out of action temporarily; port magazine of turret flooded.
*Malaya*_____	12-inch shell, range 17,000, dished in top of "X" turret; injured range finder and made hand loading necessary.
*Seydlitz*_____	12–15-inch shell, range about 12,000, failed to penetrate top No. 5 turret.
*Derfflinger*_____	12–15-inch shell, range about 12,000, pierced top No. 4 turret, exploded, ignited many powder charges, killed 79 men, and completely wrecked the turret.
*Markgraf*_____	12–15-inch shell, range about 12,000, failed to penetrate turret top.

Out of the above five cases, in one the turret was completely destroyed; in two considerable damage was done; in two no damage was done.

The gunnery officer of the *Tiger* describes the damage caused by hitting a turret roof as follows: "'Q' turret had been hit on the roof in the center sighting hood, the shell appearing to have burst there, blowing a large hole in the roof plate. Two men in the gun house were killed and several wounded, including the midshipman of the turret, who died of his wounds next day. All sights were destroyed, and the director firing circuits were cut. The right gun-loading cage was jammed, but luckily in the 'down' position, so it did not interfere with the hand loading. The left gun-loading cage was temporarily jammed, the range finder and lookout periscope smashed, but the officer of the turret was unhurt. He got his spare crew up from below, cleared away the dead and wounded, got his left gun into action with director training and laying, and fired with the sound of the other turrets' firing. Also, after a lapse of a few minutes, he got the right gun going with hand loading with his spare crew."

TABLE 13.—*Hits on turret front and rear plates.*

*Indefatigable*____	11-inch shell, range 19,000, pierced "A" turret, ignited powder charges, and in conjunction with another shell of the same salvo, exploded "A" magazine, causing the loss of the ship.
*Lion*_____	12-inch shell, range 15,000, pierced "Q" turret, exploded in gun house, killed or wounded guns' crews, ignited powder charges, killed 60 men, and put turret out of action. Flooding of magazine just in time saved the ship.
*Warspite*_____	6-inch shell, range 12,000, failed to penetrate "X" turret.
*Queen Mary*_____	12-inch shell, range 14,500, pierced "Q" turret and put right gun out of action.
*Princess Royal*__	12-inch shell, range 15,000, pierced "X" turret, blew in large piece of armor, killed left gun's crew, cut pressure mains, and put turret completely out of action.
*Princess Royal*__	12-inch shell, range about 14,000, did not penetrate "B" turret; shifted armor plate, but did no internal damage.
*Princess Royal*__	12-inch shell, range about 14,000, hit and considerably damaged muzzle, but did not interfere with fire; may have been small-caliber hit.
*Invincible*_____	12-inch shell, range 9,500 yards, pierced "Q" turret, exploded, blew off roof, ignited powder charges, and probably in conjunction with other shells of the same salvo, exploded magazine, which caused the loss of the ship.
*Seydlitz*_____	12–15-inch shell, range about 12,000, failed to penetrate, but knocked off piece of armor and put right gun out of action, No. 2 turret.
*Seydlitz*_____	12–15-inch shell hit right gun and put it out of action, No. 3 turret.
*Derfflinger*_____	12–15-inch shell pierced No. 5 turret, range about 12,000, ignited 10 powder charges, killed 73 men, and put turret out of action.
*Von der Tann*___	12–15-inch shell pierced No. 3 turret, blew in piece of armor, and killed men in gun house; turret out of action.

Of the above 11 cases, after omitting the 6-inch hit received by the *Warspite*, two resulted in the loss of the ship, four put the turret out of action, three put one gun out of action; only two did no important damage; and possibly the shell which hit the muzzle of one of the Princess Royal's guns was of small caliber. These facts demonstrate the great effectiveness of hits on front plates of turrets. As far as is known, no side plate of a turret was hit. After one of the *Seydlitz's* turrets had been wrecked and abandoned, its rear plate was pierced and the shell exploded in the gun house.

TABLE 14.—*Hits on barbettes.*

*Indefatigable*___	11-inch shell, range 19,000, probably penetrated barbette of "A" turret, and, in conjunction with one which hit the front plate, exploded the magazine, which caused the loss of the ship.
*Indefatigable*____	Three 11-inch shells of a salvo, range 19,000, exploded "X" turret magazine, having pierced either the barbette or armored deck.

*Warspite*_____ 12-inch shell failed to penetrate "X" barbette, but exploded and killed several men of the fire brigade.

*Tiger*_____ 11-inch shell, range 15,000, pierced 9-inch barbette armor, "X" turret, and put it temporarily out of action. Shell did not explode. One gun was put in firing condition again and the other was able to fire at long intervals.

*Queen Mary*____ Three 12-inch of a salvo, range 14,500, exploded "Q" turret magazine, having pierced either barbette armor or armored deck.

*New Zealand*____ 11-inch shell, range 15,000, knocked hole in "X" barbette, but did no damage.

*Seydlitz*_____ 13.5-inch shell, range 14,500, pierced 9.2-inch armor of No. 4 barbette, ignited one powder charge, killed a number of men, and put turret out of action.

*Von der Tann*___ 12–15-inch shell knocked in piece of No. 1 barbette, which jammed turret, putting it out of action; barbette armor was 10 inches thick.

*Von der Tann*___ 12–15-inch shell knocked in piece of No. 4 barbette, which jammed turret; fragments pierced armored deck.

*Tiger*_____ 12-inch shell failed to pierce "A" barbette.

Of the 10 cases given above, three caused magazine explosions and the loss of two ships; three put the turret out of action; one did considerable damage to the turret; one did not penetrate, but did damage ouside the turret; two did no important damage.

TABLE 15.—*Hits on side armor and below armor belt.*

*Tiger*_____ 11-inch shell, range 15,000, penetrated side armor; killed 12 men; caused powder fire in broadside battery; made it necessary to flood port 6-inch magazine and shell room; cut fresh and salt water mains; cut air-pressure lines; filled engine room with dense smoke; the base of shell penetrated armored deck and missed main steam line by 1 foot; water from cut mains poured down into engine room.

*Warspite*_____ 12-inch shell hit under water line and flooded some compartments aft.

*Warspite*_____ 12-inch shell penetrated side armor; flakes of armor wrecked everything in vicinity; caused small fire; knocked off armor bolts; wrecked all voice tubes and electric leads; cut fire mains.

*Warspite*_____ 12-inch shell penetrated side armor; water poured through hole and flooded deck; some went down ventilation trunks to engine room; did great amount of local damage; shell did not explode.

*Warspite*_____ 12-inch shell knocked out a large triangular piece of armor aft at water line. Flooded deck, which had to be filled up with 600 hammocks; blew holes in fresh-water and fuel-oil tanks; volumes of water went into engine room before ventilation trunks could be plugged. As a result of this and other hits *Warspite's* draft was increased to 35½ feet and speed reduced to 16 knots.

*Warspite*_____ 12-inch shell penetrated side armor forward, making large hole, which had to be covered by collision mat. All above hits on *Warspite* were made at ranges from 12,000 to 10,000.

*Lion*_____ 12-inch shell, range 15,000, penetrated side armor; exploded on mess deck; caused heavy personnel losses; together with several other shells caused a number of very bad fires, which were not put out for some time.

*Lion*_____ 12-inch shell, range 16,000, penetrated side armor; drove out armor plate; wrecked sick bay with many casualties.

*Princess Royal*__ Two 12-inch shells, range 15,000, penetrated side armor forward; put main control out of action for 20 minutes by cutting electric leads; cut many voice tubes; did great local damage.

*Princess Royal*__ 12-inch shell, range 12,000, pierced bunker; exploded, killing many of guns' crews in reserve and salvage parties; cut fire mains; caused several fires; wrecked engine room casings.

*Princess Royal*__ 12-inch shell, pierced side armor; flooded two bunkers; cut fire mains.

*Malaya*_____ Two 12-inch shells, range 16,000, dented in side armor, but did not penetrate.

*Malaya*_____ 12-inch shell, range 16,000, hit under water line and flooded three compartments.

*Malaya*_____ Two 12-inch shells, range 16,000, hit below water line; made large hole; flooded large number of bunkers and compartments, and gave ship a list of 4°.

*Seydlitz*_____ 12–15-inch shell, range about 12,000, hit side armor well forward; knocked off plate; allowed great quantity of water to enter bow.

*Seydlitz*_____ 12–15-inch shell hit side armor abreast foremast; range about 12,000; pierced armor and flooded gun deck; caused great local damage; this and other shells hitting amidships caused a great fire and put radio completely out of action.

*Seydlitz*_____ Four 12–15-inch shells pierced side armor forward or came in over it. Fragments pierced armored deck, which resulted in the flooding of practically the entire bow of the ship as far aft as the forward fireroom bulkhead. Forecastle was awash at the stem.

*Derfflinger*_____ 12–15-inch shell knocked off two armor plates forward and allowed a great quantity of water to enter.

*Derfflinger*_____ Two 12–15-inch shells failed to penetrate armor belt; these shells or others knocked off muzzles of four 6-inch guns on port side.

*Derfflinger*_____ 12–15-inch shell knocked off armor plate amidships; sent splinters half way through ship; caused a terrific fire, which could not be put out for a long time.

*Moltke*_____ 13.5-inch shell hit below water line and flooded one bunker.

*Moltke*_____ 13.5-inch shell, range about 15,000, pushed in plate 20 cm. and allowed one compartment to fill with water.

*Von der Tann*__ 13.5–15-inch shell pierced 6-inch armor and allowed water to come in above armored deck.

Helgoland	13.5-inch shell, range 13,000, apparently burst while penetrating 8-inch side armor; had no explosive effect and did no damage inside.
Markgraf	12–15-inch shell, range about 12,000, knocked off two plates of side armor aft, bounced off armored deck without penetrating.
Tiger	11-inch shell, range about 15,000, pierced side armor and did great local damage.
Tiger	11-inch shell, range about 14,000, pierced side armor and did great local damage.
Tiger	Three 11-inch, range 15,000, did not penetrate side armor; one dished in armor plate.

Of the 32 cases where side armor was hit, there were only six where no damage was done to the ship; in all the other cases the shell either penetrated, knocked off a plate or plates, or drove in the plate so as to allow water to enter the compartment. There is only one record of a shell hitting the armored deck; in this case the shell had already penetrated the side armor and naturally expended most of its energy; it bounced off without penetrating. In only two cases was the armored deck pierced by fragments. No damage of importance was done to any engine or fireroom of a battleship or battle cruiser. No injury was received which affected the fire of the main battery, except when the main control of the *Princess Royal* was put out of action for a short time.

The most serious damage was received by the *Seydlitz*, whose draft was 39 feet when docked, but part of this was caused by a torpedo hit. Even under these conditions the ship made 21 knots returning to port. The *Derfflinger*, while having a lot of water in forward, was still able to make full speed. The *Malaya* was given a list of 4°, but had no difficulty in holding her place in formation. It is true that the *Lutzow* was sunk partly as a result of hits on the side armor, but a torpedo hit contributed greatly to her loss, and it was even then necessary to sink the ship with a torpedo fired by a German destroyer.

Everything considered, hits on the side armor, while doing a great deal of local damage, had very little effect on the fighting efficiency of the ship. The damage caused was slight when compared with that caused by hits on turrets and barbettes.

TABLE 16.—*Hits on broadside battery compartments.*

Warspite	12-inch shell, range about 12,000, pierced casemate armor and burst in 6-inch battery; caused casualties and fire.
Warspite	12-inch shell, range about 12,000, burst on deck above gun deck; fragment came down through deck, ignited five boxes of 6-inch powder charges; burned all one gun's crew and several of another; fire quickly put out.

Malaya	Two 12-inch shells, range about 16,000, exploded in battery; ignited ammunition boxes; powder fire spread along entire starboard battery, putting it completely out of action; very heavy personnel losses; all electric leads ruined; galley wrecked; one 6-inch gun wrecked.
Colossus	12-inch shell, range 12,000, exploded in superstructure; fragment ignited ammunition box and fire spread until 10 had been burned; put one 4-inch gun out of action; wounded two men; fragment broke range-finder prism in "P" turret; fumes were sucked into fireroom until ventilators could be stopped.
Lion	12-inch shell, range 15,000, exploded in 4-inch battery; caused fires and burned some ammunition; cut fire mains.
Seydlitz	12–15 inch shell, range about 12,000, pierced casemate armor 6 inches thick; put No. XI 6-inch gun out of action; killed entire crew; few fragments pierced casemate bulkhead.
Seydlitz	Same for No. VII 6-inch gun.
Moltke	13.5-inch shell, range about 15,000, pierced 6-inch armor, exploded in bunker, and put out of action 6-inch gun above bunker.
Markgraf	12–15 inch shell, range 12,000, pierced casemate armor 6 inches thick, and put 6-inch gun out of action.

Of the above 10 hits in the broadside battery, only the two hits received by the *Malaya* did important damage, and even this damage had no influence on the part taken by the ship in the day action. In six other cases one gun was put out of action, either by material damage or personal losses. In general, hits in the broadside battery were very ineffective.

TABLE 17.—*Hits on fire-control towers and armored tubes.*

Warspite	12-inch shell, range about 12,000, wrecked armored communication tube to after director; caused three casualties in director station above.
Derfflinger	12–15 inch shell, range 12,000, failed to penetrate fire-control tower; did no damage inside.

TABLE 18.—*Hits on unarmored decks and superstructures.*

Warspite	12-inch shell, range about 12,000, blew in side near water line aft and allowed small quantity of water to come on board.
Warspite	One to four 12-inch shells, range about 12,000, completely wrecked cabins aft; no important damage.
Warspite	12-inch shell, range about 12,000, came through deck aft; cut fire mains; blew center line armored door off hinges; great local damage.
Warspite	12-inch shell, range about 12,000, wrecked galley.
Warspite	12-inch shell, range about 12,000, exploded in superstructure; started fearful fire; burned 400 swimming collars; burned out practically all superstructure, which was completely wrecked by this and other shells.

*Warspite*_____ 12-inch shell, range about 12,000. made hole in funnel base. failed to penetrate armored grating; bounced up and smashed cutter.

*Lion*_____ 12-inch shell wrecked galley.

*Princess Royal*__ 12-inch shell, range about 15,000, came through deck, wrecked admiral's cabin; killed many of salvage party and broadside crews in reserve; gassed many men and started several fires.

*Barham*_____ 12-inch shell, range about 17,000, came in main deck; killed many of medical and radio parties and broadside crews in reserve; put auxiliary radio out of commission; injured many ammunition hoists; cut voice tubes and caused bad fires.

*Barham*_____ 12-inch shell, range about 17,000 came in through deck; did considerable local damage; fragments cut feeders and put main radio out of commission.

*Derfflinger*_____ 12–15 inch shell wrecked chart house and did local damage.

*Moltke*_____ 13.5-inch shell came through side above armor and knocked off armor plate on other side of ship, which caused considerable amount of water to enter.

*Warspite*_____ 12-inch shell caused fearful wreckage in sick bay and started fire which lasted about four hours.

*Warspite*_____ 6-inch shell wrecked wardroom furniture.

*Lion*_____ 12-inch shell, range about 15,000, came into forecastle and did local damage.

*Lutzow*_____ 15-inch shell put main and auxiliary radio out of action.

*Tiger*_____ 11-inch shell did local damage in forecastle.

*Tiger*_____ Two 11-inch shells wrecked sick bay.

Of the above 19 to 22 hits, only 1 hit on the *Warspite*, 2 on the *Barham*, and 1 on the *Moltke* did any appreciable damage.

*Warspite*_____ 12-inch shell knocked down crane across picket boat.

*Warspite*_____ 6-inch shell cut clean hole through mainmast; no damage.

*Colossus*_____ 12-inch shell burst short about 30 yards; fragments wrecked searchlight and charthouse; wounded one man on bridge and two in foretop.

*Princess Royal*__ 12-inch shell pierced base of funnel.

*Nassau*_____ 4-inch shell hit after searchlight station; cut distant-control cables and put all searchlights on port side out of action (night action).

*Rheinland*_____ 4-inch shell wrecked searchlight (night action).

*Markgraf*_____ 12–15 inch shell pierced mast; mast did not fall, but all communications to top were cut and mast had to be abandoned.

*Lion*_____ 12-inch shell seriously damaged base of No. 2 funnel.

*Lion*_____ 12-inch shell pierced mainmast.

*Lion*_____ 12-inch shell shot down crane.

*Tiger*_____ Three 11-inch shells pierced Nos. 2 and 3 funnels.

*Tiger*_____ 12-inch shell injured crane, boats, and did local damage.

*Derfflinger*_____ 4-inch shell from destroyers range 7,000, cut down antennæ.

*Derfflinger*_____ 4-inch shell from destroyers, range 7,000, hit foremast and cut telephone to foretop.

In addition, *Derfflinger* later in the action had all communications with the foretop shot away; also all signal halliards shot away. *Warspite* had all signal halliards shot away; all mainstays shot through; all searchlights on superstructure wrecked. *Seydlitz* had all radio shot away. *Princess Royal* had holes in both struts to masts; two funnels pierced; numerous shrouds and guns shot away; many ventilation fans, searchlights, and fire-control telephones damaged or destroyed.

The Austrian naval attaché, from whose excellent report much of the above data concerning German ships is taken, supplies the following additional information:

(*a*) The devices for transmission of gunnery orders functioned without interruptions and were able to withstand the greatest shocks.

(*b*) The German system for minimizing the effects of hits which allowed water to come into the ship worked excellently and accounted for the saving of the *Seydlitz*, which was down by the bow so much that the forecastle was awash and also had a list of 7°. The *Derfflinger* had on board 3,400 tons of water, which seemed to have no effect on her military readiness for action.

(*c*) Gases and smoke from bursting shell were carried throughout the ship through ventilating trunks and voice tubes. "All officers," writes the attaché, "emphasized to me the fact that according to their experience the masks were an absolute necessity and that not only did they save an extraordinary number of human lives but made possible work and service in compartments which otherwise would have had to be unconditionally abandoned. In many cases a great part of the personnel of turrets which were struck could escape, thanks to the masks, remaining at their posts long enough to carry away those seriously wounded; in one instance the personnel of the main engine room into which asphyxiating gases had penetrated were able to stay at their post until the compartment was ventilated."

(*d*) All engine and boiler rooms, except the *Seydlitz's* forward boiler room, remained intact and not even an auxiliary engine failed.

(*e*) The armored engine room grating on the *Von der Tann* prevented injury below.

(*f*) The Germans used steel tanks, which had lids that screwed on, for main battery ammunition. This probably prevented several magazine explosions.

(*g*) The Germans used automatic closing asbestos pads on their broadside magazine hoists, which prevented blast of shells from penetrating to magazine.

(*h*) On the *Von der Tann* the magazine flood valves were covered with débris and magazine could not be flooded.

(*i*) Bunker manholes were blown off by shells exploding in the bunker.

(*j*) There were no drainage suctions above the armored deck; these were badly needed.

(*k*) Searchlights were undamaged; this is apparently meant as a general statement, as Von Hase says that only one searchlight remained in service on the *Derfflinger*.

(*l*) The port engine of the *Markgraf* was put out of action by the melting of the stern tube bearing; this was probably caused by a hit in the vicinity, throwing the shaft or tube out of line. The ship had to leave formation, as the necessary speed could not be made with the remaining two engines.

The following conclusions are respectfully presented:

(a) By far the greatest damage was done by shells hitting the face plates of turrets; as these are comparatively small and weigh very little, they should be made thick enough to prevent the penetration of the largest caliber shells at 5,000 yards range; they should be 20 inches thick if necessary.

(b) The barbettes proved to be very vulnerable points; the increase in their thickness involves the addition of a great deal of weight to the ship, however, their armor in the sectors between the bow and quarter—i. e., 45–135 and 225–315 relative—should fulfill the above requirements for face armor; the other sectors are not so important, but should be able to resist the penetration of the largest projectile at 10,000 range.

(c) Some damage was caused by hitting turret tops. As only a relatively thin plate is required, turret tops should fulfill the requirement of resisting penetration or knocking in the plate by any projectile at any range up to 25,000 yards.

(d) The armor on the sides and back of turrets is of practically no importance; if it can resist a 6-inch shell at 5,000 yards range it is satisfactory. The weight gained in this way can be used for increasing the thickness of face and top plates.

(e) It will never be practicable to have side armor thick enough to prevent penetration. The present side armor fulfills its purpose of taking up the greater part of the energy of the shell and bursts it before it can hit the protective deck, which is then thick enough to keep out the fragments; a lot of local damage is caused, but the main battery and engineer compartments are kept intact. The protective deck proved to be thick enough for its purpose, except in the case of the "Seydlitz," when it was pierced by fragments, which allowed a large quantity of water to enter. Armored gratings proved to be necessary. The present thickness of side armor and protective deck are sufficient; if necessary to compensate for the added weight due to increase in thickness of barbettes, the side armor should be reduced. It is by far the least important

of all armor. Many armor plates fell off, and the methods of securing plates to the hull should be tested out.

(f) Fire is a very serious factor in battle; there are reports of 14 powder fires and 15 other fires; in six cases it is reported that fire mains were cut. It is evident that every precaution should be taken in the handling of powder in both turrets and broadside batteries, and it is believed that our safety precautions provide for this. There will be a certain number of other fires, no matter what precautions are taken; they do not have such a decisive effect as do powder fires, and can be handled by the regularly detailed fire and repair parties; when clearing ship for action as much inflammable material as possible should be thrown overboard or stowed below the protective deck; this applies to chests, papers, clothing, and medicines; this question should be considered with great attention to detail on the individual ships. The cut fire mains not only prevented fires from being put out, but filled the decks with great quantities of water, some of which ran down below through ventilation trunks. It might be possible to remedy this condition by running more leads under the protective deck or by the installation of numerous cut-out valves and hose plugs, so that sections cut by shells can be closed off and adjacent plugs used.

(g) There are five instances of voice tubes being cut and seven of electrical leads being damaged; doubtless a great many more occurred; in most cases the damage did not have an important effect; in general the communication systems were surprisingly little damaged and were very satisfactory.

(h) There were six instances of the radio installation being put out of action; it was remarkable that the "Lion," "Barham," and "Lutzow"—all flagships—had their radio destroyed; when Hipper shifted his flag from the "Lutzow" he was informed that both the "Derfflinger" and "Seydlitz" also had had their radio destroyed. It would appear that this condition can be remedied; possibly it has been already.

(i) In the above reports there are 13 instances of hits causing water to enter the ship. It is recommended that the German system of handling the question of drainage and repairs be adopted. It consisted of—

1. The instruction of personnel in maintaining the water-tight integrity of the ship, principally by means of a large model of the ship, showing all the compartments, water-tight doors, drainage system, and fire mains in all their details.

2. The stationing of men in each compartment or group of compartments with direct communication with the central station for the purpose of taking immediate action in effecting repairs and of informing the central station.

3. The detailing of thoroughly instructed repair parties prepared for every emergency.

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Valves should be installed in ventilation trunks leading below the armored deck. Drainage suctions above the armored deck should be provided.

(j) Hits on the unarmored parts of the ship, including the upper works and funnels, did no appreciable damage. No masts were seriously damaged by hits, and only two men were wounded in the tops. The light splinter-proof armor of the tops proved satisfactory.

(k) There is considerable danger from gases, smoke, and powder fumes. This was noted in turrets, broadside batteries, engine rooms and firerooms, sick bays, conning towers, and plotting rooms. Gas masks should be provided.

II. THE EFFECT OF GUNFIRE ON CRUISERS AND LIGHT CRUISERS.

The effect of gunfire on cruisers has little interest now, because the type which took part in the battle is now obsolete. Three vessels were hit—*Black Prince*, *Defense*, and *Warrior*. Little is known of the loss of the first two. The former was sunk by the fire of German battleships at night at close range as the result of a magazine explosion; she was under fire four minutes and was probably hit many times. The *Defense* was under fire for about 12 minutes and was probably hit many times by large shells. She was sunk as the result of the explosion of "A" turret magazine by a salvo of four shells, all of which probably hit. They penetrated either the turret or barbette armor.

The *Warrior* was hit by at least 15 large shells. The shell which did the most damage penetrated the side armor at the water line, went through the after-reserve coal bunker, and exploded as it passed through the engine-room center-line bulkhead; fragments went clear through the ship's bottom in the starboard engine room, and both rooms were flooded to within 10 feet of the main deck as a result. This shell also cut the auxiliary steam line, and this filled both engine rooms with steam. The situation was further complicated by the fires which raged on the main deck for over two hours and cut off all access to the engine room. About six shells had penetrated the side armor and burst on the main deck, wrecking everything and causing about 80 casualties. Masts and funnels remained standing, although pierced many times. The ship finally sank the next morning as a result of the engine rooms filling and the water coming in on the main deck through shell holes through the side armor at or above the water line.

All the above facts again demonstrate the absolute necessity of giving adequate protection to the turret magazines, whose explosions caused the loss of two cruisers. On the other hand, in the case of the

Warrior, where a magazine was not exploded, it required at least 15 hits by heavy shell, and probably many more, to cause the loss of the ship; in even this case, however, practically all the crew was saved; 800 trained officers and men were an asset in a naval war of more value than the cruiser they manned.

A number of light cruisers were badly damaged, but there are only a few about which there is accurate information.

The *Wiesbaden* was a fine new light cruiser of about 5,000 tons. It is probable that she was hit by 11 heavy shells, two 9.2-inch projectiles, a number of 6-inch and 4-inch from the secondary batteries of capital ships, and a large number of 4 inch from the *Onslow*. She was also hit by one torpedo. The following damage is known to have been caused by these hits:

(*a*) All engines put out of commission by a 12-inch shell from the Third Battle Cruiser Squadron.

(*b*) One funnel carried away.

(*c*) Entire battery except forecastle gun put out of action.

(*d*) A great fire started aft.

(*e*) The ship went down during the night, probably about 2 a. m.

The ability of a light cruiser to stand this punishment is simply astounding.

The *Southampton* was hit by about twenty 4.1-inch shells at 1,500 yards range in a night action with German light cruisers, which lasted four minutes. The following is a list of the more important damage sustained:

(*a*) Six 6-inch guns amidships put out of action due to material injuries or personnel losses. Of the 66 men who composed the crews of these guns 47 were killed and wounded.

(*b*) All gunnery communications and voice tubes were cut, including those to the uninjured forecastle and quarterdeck guns. All telephones ruined.

(*c*) Both searchlights of the after group were completely wrecked and their crews killed.

(*d*) Funnels and masts riddled with fragments. Boats destroyed.

(*e*) Ten holes through the side, of which three on the waterline admitted some water.

(*f*) Fire mains cut, temporarily flooding the decks.

(*g*) One small and two very large powder fires, which sent flames as high as the masthead.

The *Dublin*, which followed the *Southampton*, was hit by thirteen 4.1-inch shells, about half of which did not explode. The effect was as follows:

(*a*) Two side armor plates pierced; two other shells through the ship's side.

(*b*) A number of bulkheads and coal chutes pierced.

(*c*) Fire main cut.

(*d*) Chart house wrecked: all charts and navigational data lost.

(*e*) Radio trunk shot away.

(*f*) Many voice tubes and nearly all telephone and fire-control cables damaged.

(*g*) One large fire started in seamen's mess deck.

(*h*) Twenty-seven casualties.

The *Chester*, a fine new light cruiser, received about 20 6-inch hits at a range of about 6,000 yards. They had the following effect:

(*a*) Four 5.5-inch guns out of action; two had to be completely renewed.

(*b*) After control station destroyed.

(*c*) All gunnery voice tubes and electrical communications wrecked after the first salvo. Many other electric leads damaged.

(*d*) Four side armor plates pierced: one shell through side above armor.

(*e*) Forecastle deck holed and splintered in many places.

(*f*) All funnels holed, foreward funnel very badly; much rigging shot away.

(*g*) Six boats unseaworthy.

(*h*) Bridge considerably damaged.

(*i*) Splinters did slight damage to tubes of two boilers.

(*j*) Fire main cut; number of small water and steam pipes cut.

(*k*) Five fires, mostly powder.

(*l*) Eighty-one casualties.

The *Castor* was hit in a night action by 10 shells, probably 4.1-inch from light cruisers, but possibly 5.9-inch from German battleships. They caused the following damage:

(*a*) One shell exploded as it hit the side, blowing a hole in it 4 feet square, wrecking bulkheads, fire mains, ventilation system, voice tubes to guns, and caused five casualties.

(*b*) One shell penetrated the side armor just above the water line.

(*c*) Three shells struck the bridge, killed five men, carried away steering gear, cut all electrical circuits, and wrecked radio.

(*d*) One shell exploded on the forecastle, killing two men.

(*e*) About three shells exploded against the side armor, fragments damaging guns, after control, funnels, and boats.

(*f*) One shell set fire to motor boat.

(*g*) Total casualties were 36.

Various items of minor damage to light cruisers is shown in the table below:

TABLE 19.—*Additional damage to light cruisers.*

Galatea	6-inch shell, range 15,000, did not explode and did no damage.
Galatea	Shell fragment entered engine-room casing and wrecked a forced-draft fan, reducing the speed from 27 to 18 knots.
Falmouth	6-inch shell hit foremast and cut voice tubes.
Falmouth	6-inch ricochet came in aft and did no damage.
Canterbury	4.1 inch armor-piercing shell passed through ship's side and two bulkheads, but did not explode.
Hamburg	6-inch shell carried away a funnel; three other hits; casualties 38.
German light cruiser	6-inch shell wrecked searchlights.
Calliope	12-inch shell and four 6-inch shells caused 21 casualties; material damage unknown.
Frankfurt	Four 6-inch hits; casualties 21; material damage unknown.
Pillau	12-inch shell; casualties 26; material damage unknown.
Stettin	Two 6-inch hits; casualties 25; material damage unknown.
Munchen	Two 6-inch hits; casualties 35; material damage unknown.

The following conclusions may be drawn from the above data showing the effect of gunfire on light cruisers:

(a) Gunfire had practically no effect on the hull and engineer compartments.

(b) In almost every case all voice tubes, telephones, and other communications to the battery were shot away, practically destroying the usefulness of the battery. Two suggestions are offered to remedy this defect:

1. Do away with the side armor and use the weight gained to run armored trunks to the guns, through which all communication leads can be run; an alternative plan would be to run all horizontal communications under the protective deck, with armored tubes for the vertical leads to come up under the guns.

2. To duplicate all leads to the guns at such distances apart that one shell can not pierce both leads. This question is of great urgency and should be given special consideration.

(c) There were very heavy casualties among gun crews, caused by shell fragments. This loss can be met in two ways:

1. By using particularly large splinter-proof gun shields or gun houses.

2. By training reserve sets of gun pointers and sight setters, who will remain below the water line until required for replacement.

(d) Quite a number of guns were injured. This condition would also be helped by the use of large gun shields or gun houses. The question of

a shield of moderately heavy armor—about 4 inches—might offer a solution, the weight to be gained by omitting the side armor.

(e) Hits on the upper works, funnels, masts, and rigging were of no importance. In two instances the after control station was destroyed. The question of providing 4-inch armor for this should be considered.

III. THE EFFECT OF GUNFIRE ON DESTROYERS.

If light cruisers showed that they could stand tremendous punishment without being put out of action or sunk, destroyers, considering their smaller size, showed similar characteristics of resistance.

TABLE 20.—*Destroyers put out of action by gunfire.*

Ship damaged.	Hits.	Place hit.	Detailed damage.
Spitfire	Two 6-inch	Bridge	Completely wrecked bridge; caused great fire; killed almost all personnel on bridge. At the same time collision knocked down foremast and forward funnel and wrecked forward part of ship; speed reduced to 6 knots; heavy casualties.
Tipperary	Great number 6-inch.	Bridge; engine room; all over ship.	Bridge completely wrecked; personnel all killed; steering gear jammed; main steam line cut; three hits aft did little damage; great fire started forward; ship sank two hours later; many killed.
Ardent	do	Engine room; all over ship.	Principal damage caused in engine room; steam lines cut and ship stopped; dynamo out of commission; guns continued fire and were put out of action one by one; ship sank in ½ hour; only 40 survivors when ship sank; all of these were drowned but one.
Fortune	do	do	Steam lines in engine room or firerooms cut and ship stopped. Was overwhelmed by enemy fire at point-blank range. Guns continued firing until ship sank.
Turbulent	do	All over ship	Details of damage are not known; ship was literally blown out of the water at point-blank range.
Onslaught	One 6-inch	Bridge	Seven casualties; steering gear shot away; box of ammunition exploded; bridge completely ruined.
Porpoise	Two 6-inch	Bridge; fireroom	Steering gear and engine room telegraphs shot away; shell exploded at base of after funnel; killed one man at midship gun; killed one and wounded one at forward tube; exploded air chamber of spare torpedo; blew in deck; burst main steam line; had to stop engines; later were able to make 10 knots.
Shark	Great number 4-inch.	Bridge; fireroom; all over ship.	Bridge wrecked and steering gear shot away; oil suction pipes in fireroom shot away and ship stopped; only one gun left in action; very heavy casualties; ship finally sunk by torpedo.

TABLE 20.—*Destroyers put out of action by gunfire*—Continued.

Ship damaged.	Hits.	Place hit.	Detailed damage.
Nomad	Great number 6 or 4-inch.	Bridge; engine room; fireroom; all over ship.	Shell burst in engine room; tore up deck; killed chief engineer and caused other casualties; carried away bulkhead stop and numerous steam lines, filling engine room with steam and stopping ship; feed tanks shot away; radio and searchlight damaged, but otherwise bridge not injured; ship was later sunk by point-blank fire of battleships at ranges as low as 500 yards; forward magazine blew up and No. 2 boiler hit.
V-29	Great number 4.7-inch.	All over ship	Details of damage unknown: numerous hits all over ship were made at 1,000 yards range by British destroyers.
S-35	One 12-inch	Engine room	Ship sank immediately.
Nestor	Two 6-inch	Firerooms	Nos. 1 and 2 boilers hit and ship stopped; probably other hits, but they are not reported; ship was later sunk by battleships at close range.
Broke	Two 11-inch; eight 6-inch; two 4.1-inch.	Fireroom; bridge; other places.	Three forward boilers put out of commision by one 11-inch shell; bridge wrecked, steering gear jammed, resulting in the ramming of Sparrowhawk; 82 casualties; severe additional damage to forward part of ship was caused by collision.
G-40	One 6-inch	Engine room	Main engines out of commission; had to be towed into port.
S-32	....do	Fireroom	Feed lines or tanks damaged; ship stopped; got into port by using salt feed.
V-48	One 12-inch	Engine room	Ship stopped; overtaken and sunk by four destroyers.
Acasta	Five 4.1-inch	Engine room; other places.	Shell burst in engine room; smashed steering engine; set fire to storeroom; wrecked dynamo; cut exhaust pipes; filled engine room with steam; broke emergency stop so engines could not be stopped; boilers also reported out of action in signal.
Onslow	One 12-inch; two 6-inch.	Engine room; fireroom.	Heavy shell cut steam lines in engine room and reduced speed to 10 knots. Two hits in fireroom, pierced main feed tank and lost all fresh water, stopping ship. Had to be towed into port.
Defender	One 12-inch, ricochet.	Fireroom	Made large hole in side; cut steam lines; started fuel-oil fire; speed reduced to 15 knots, using after boiler.

TABLE 21.—*Destroyers hit but not put out of action.*

Ship damaged.	Hits.	Place hit.	Detailed damage.
Moorsom	One 4.1-inch	Aft	Some fuel oil leaked out of tanks, reducing steaming radius of ship.
Spitfire	Five 6-inch	Fireroom; aft	No. 2 boiler out of commission; considerable casualties among gun and torpedo crews.

TABLE 21.—*Destroyers hit but not put out of action*—Continued.

Ship damaged.	Hits.	Place hit.	Detailed damage.
Petard (first salvo).	Three 6-inch	Aft	Killed or wounded after gun's crew and supply party; wrecked cabins.
Petard (second salvo).	.....do	Fireroom; upper works.	Shell blew in deck and broke fuel-oil line, starting fire; splinters pierced funnels and side; slight structural damage by third shell.
Nessus	One 6-inch	Fireroom	One boiler out of commission.
Obdurate	Two 4.1-inch	Not known	Slight damage only.
Attack	Nose—11-inch	Aft	Fell through deck into wardroom; slight damage only.
Garland	Two 6-inch	Amidships	Wrecked one boat.
Marvel	One 12-inch	Not known	Slight damage only.
Ardent	Two 6-inch	.....do	Do.
Marne	One 6-inch	.....do	Do.
Three German destroyers.	Some 6-inch	.....do	Do.

The following conclusions may be drawn from these facts:

(a) Of the 33 shoots at destroyers listed above where hits were made 19 resulted in putting the destroyer out of action and 14 caused only slight damage and allowed the destroyer to continue in the battle.

(b) Of the 17 cases where the cause of putting a destroyer out of action is known, there are six cases where damage to the bridge brought about this result, nine where damage to the engine room was decisive, and seven where it was injuries in the fire rooms. In many of the above cases there was damage to two or three of the above localities, any one of which would have put the boat out of action. It will therefore be seen that the best target at which fire should be directed is the after funnel and the water line, so that hits will be made in the engine room and fire rooms; hits in this part of the ship will probably cause damage in one or more of the following ways:

1. Reducing the speed or stopping the ship by cutting steam, oil, or feed lines or by hitting boilers or turbines.
2. Wrecking the generators and thus putting out all electric leads.
3. Filling the ship with water by piercing the side or bottom.
4. Starting fuel-oil fires.
5. Putting steering gear out of commission by cutting wheel ropes or steam lines to steering engine.
6. Putting amidships guns out of action by material damage or personnel losses.
7. Putting torpedo tubes out of action in same way by exploding air flasks.
8. Cutting electrical circuits and voice tubes, nearly all of which go through the engine and fire rooms.

(c) There were a great number of fires. The Germans state that practically all British destroyers hit during the night action caught fire. In

most cases fuel oil or ammunition burned. This is a serious condition, but there appears to be no remedy.

(d) In no case was a ship sunk, so far as is known, without there being ample time to fire all torpedoes. In the case of the "Nomad" the list of the ship was so great that the last torpedo fired may have injured its tail in clearing the tube. On the "Shark" and "Porpoise" the spare torpedoes both had their air chambers exploded before they could be fired, and the "Spitfire" was unable to load its spare torpedo, but there is no record of the tubes or the torpedoes originally in the tubes being injured. This is quite remarkable.

(e) The guns, in general, were but little damaged, and even on ships which were very badly damaged or sunk one or more guns continued firing until the last.

PART III. TORPEDO FIRE.

I. TORPEDO FIRE BY BATTLESHIPS AND BATTLE CRUISERS.

TABLE 22.—*Results of torpedo fire by battleships and battle cruisers.*

Firing ship and torpedoes fired	Target and number of ships in it.	Firing range.	Target angle.	Target speed.	Results of torpedo fire.
		Yards.	°	*Knots.*	
Marlborough (1)	Wiesbaden (1)	10,000	.....	0	Probably missed.
Princess Royal (1)	Battle Squadron II (6)	9,500	300	16	Missed.
Valiant (1)	Battle Squadron III (7)	14,000	280	18	Do.
Malaya (1)	....do	12,900	290	18	Do.
Moltke (4)	Battle Cruiser Fleet (6–4).	(?) 14,000	270	25	All missed.
Derfflinger (1)	Battle Fleet (24)	9,000	90	15	Missed.
Revenge (1)	Scouting Division 1 (4)	9,000	225	20	Do.
Marlborough	Battle Squadron III (7).	11,000	230	15	Do.
German B. F. (data uncertain).	Battle Fleet and Battle Cruiser Fleet (30).	12,000	90	15-25	Three astern Tiger; one under Princess Royal; one close to Marlborough.

Much of the data in this table, particularly the target angles, is estimated. It is practically certain that all the 16 torpedoes missed. This is to be expected because of the excessive ranges and the fact that torpedoes were fired singly, thus making it very easy for the target ships to avoid them by maneuvering. While, of course, the torpedo is the secondary weapon of the battleship and battle cruiser, it is nevertheless believed that they should be used with effect by these vessels. The first requirement of successful fire is tha salvos of a large number of torpedoes be fired. This requires intership communication but is easy of accomplishment. The great length of the firing formation will give a very fine criss-cross battery, if the fire of our entire line is concentrated, as it should be, on an interior division of the enemy battle line. *It is recommended that a system of salvo fire for the battleship divisions be developed.*

II. TORPEDO FIRE BY LIGHT CRUISERS.

TABLE 23.—*Results of torpedo fire by light cruisers.*

Firing ship and torpedoes fired.	Target (ships in target).	Range.	Target angle.	Target speed.	Results of torpedo fire.
		Yards.	°	*Knots.*	
Calliope (1)	Battle Squadron III (8).	6,500	300	18	Missed; possibly passed line.
Caroline (2)	Battle Squadron II (6).	8,000	(?)270	16	Do.
Royalist (1)	....do	8,000	(?)270	16	Do.

TABLE 23.—*Results of torpedo fire by light cruisers*—Continued.

First ship and torpedoes fired.	Target (ships in target).	Range.	Target angle.	Target speed.	Results of torpedo fire.
		Yards.	°	*Knots.*	
Falmouth (1).....	Scouting Division I (5).	5,500	230	25	Possibly hit Lutzow.
Yarmouth (1).....	.....do.....	5,500	230	25	Do.
Nottingham (1).....	Battle fleet (22).....	16,500	340	18	Missed; possibly passed line.
Falmouth (1).....	Wiesbaden (1).....	5,000	.....	0	Probably did not hit.
Southampton (1)....	Scouting Division IV (5).	1,500	270	20	Sank Frauenlob.
Frankfurt (1).....	Third Battle Cruiser Squadron (3).	9,000	300	25	Probably passed formation.
Elbing (1).....	.....do.....	9,000	300	25	Do.
Pillau (1).....	.....do.....	9,000	300	25	Do.
Castor (1).....	Scouting Division II(3)	2,000	270	20	Missed; possibly passed line.

Of the above 13 torpedoes fired by light cruisers, there was one certain hit and one possible hit. The comparatively close ranges at which the torpedoes were fired show the great possibilities of torpedo fire from light cruisers, but better results could have been obtained if large salvos had been fired rather than individual shots. To be really effective light cruisers should be capable of firing a salvo of at least four torpedoes from each vessel of the firing unit. The sinking of the *Frauenlob* brings out the excellent chances of using torpedoes in night actions between light cruisers. Torpedo fire under these conditions has the advantages of short range and invisibility of torpedo wakes.

III. TORPEDO FIRE BY DESTROYERS DURING THE DAY ACTION.

A. Attack of Thirteenth Flotilla and Attached Destroyers from 4.30 to 5.10 p. m.

The attack was commenced by 12 destroyers organized in three divisions from a position about broad on the bow of Scouting Division I, which consisted of five battle cruisers. The flotilla commander was in a light cruiser, the *Champion*, and exercised no control over the attacking force, not even ordering the time to make the approach. When the attacking force got within range, the divisions in most cases broke up, partly as a result of a fight with German destroyers; there was no centralized torpedo fire, and each commanding officer fired at discretion, usually only one torpedo at a time. The German battle cruisers avoided the greater part of the torpedoes by radical changes of course away; more torpedoes were avoided when the battle cruisers countermarched, but some British destroyers continued the attack after this change of course and at 4.57 the

Seydlitz was hit, probably by the *Nerissa*. Some destroyers continued on and fired at the Battle Fleet. The *Moresby* and *Onslow* made a later attack on the battle cruisers. Of the 14 destroyers which took part in the attack, 7 only fired torpedoes. The *Petard* sank the *V–27* by a close-range shot. Generally speaking, the attack was a successful one; the fine initiative of commanding officers made up to some extent for the lack of flotilla and division control in maneuvering and torpedo fire.

TABLE 24.—*Results of attack of Thirteenth Flotilla and attached destroyers from 4.30 to 5.10 p. m.*

Firing ship.	Torpedoes fired.[1]	Target.	Ships in target.	Range.	Target angle.	Target speed.
				Yards.	°	(?) *Knots*
Petard	1	V-27	1	(?) 1,000	60	30
Do	3	Scouting Division 1	5	7,000	45	25
Nerissa	2	do	5	7,000	(?) 270	25
Moresby	1	Battle Squadron III	7	7,000	325	18
Nicator	2	Scouting Division I	5	6,000	70	25
Do	1	Battle Squadron III	7	3,000	325	18
Moorsom	4	do	7	(?) 5,000	325	18
Nestor	2	Scouting Division I	5	10,000	75	25
Do	1	do	5	4,500	75	25
Do	1	Battle Squadron III	7	(?) 2,000	330	18
Nomad	4	Battle Squadron I	9	(?) 3,000	0	18

[1] 22 torpedoes—2 hits.

B. Attack of Onslow and Fourth Flotilla Destroyers from 6 to 6.30 p. m.

The *Onslow* made an individual attack and fired at the *Wiesbaden*, Scouting Division I, and Battle Squadron III. The *Shark* and three other destroyers made a divisional attack on Scouting Division I, in which torpedoes were fired singly by the individual vessels.

TABLE 25.—*Results of attack of Onslow and Fourth Flotilla destroyers from 6 to 6.30 p. m.*

Firing ship (torpedoes fired).[1]	Target.	Ships in target.	Range.	Target angle.	Target speed.	Results of fire.
			Yards.	°	*Knots.*	
Onslow (1)	Wiesbaden	1	2,000	90	0	Hit under conning tower.
Do	Scouting Division I	5	8,000	300	25	Possibly hit Lutzow.
Onslow (2)	Battle Squadron III	8	8,000	315	18	Possibly crossed line.
Acasta (1)	Scouting Division I	5	4,500	300	25	Possibly hit Lutzow.
Ophelia (1)	do	5	8,000	270	25	Possibly crossed line.
Shark (2)	Wiesbaden	1	Data unknown.		0	Probably did not hit.

[1] 8 torpedoes, 2 hits—one on Wiesbaden; one on Lutzow.

This attack was a very successful one; it was excellently carried out; although made by but five boats, it compelled the two scouting divisions at the head of the German line to retire.

Out of 30 torpedoes fired in the day action, the British destroyers made four hits, a very high percentage: one hit was on a destroyer, one on a light cruiser, and two on battle cruisers proceeding at high speed. This demonstrates the fact that destroyers should be ready to fire at all classes of vessels in a day action; this requires outside devices for setting the depth mechanism of torpedoes without removing them from the tubes. It is noted that the *Petard* used a depth setting of 6 feet for sinking the *V–27*.

C. Attack of Flotilla IX and the Third and Eleventh Half Flotillas from 4.30 to 5 p. m.

Flotilla IX, supported by the Third Half Flotilla and the *Regensburg*, fired 12 torpedoes from a position about 20° abaft the port beam of the Battle Cruiser Fleet and distant about 9,500 yards; most of these torpedoes were probably fired at the Battle Cruiser Fleet from this unfavorable position. However, it would have been much more desirable to have fired at the Fifth Battle Squadron with a firing range of about 12,000 and a target angle of 315°, and several destroyer commanders apparently did this, as one torpedo was noted to pass ahead of the *Valiant* and one astern and the Fifth Battle Squadron was maneuvered away from the attacking destroyers. This attack was entirely unsuccessful, as the British destroyers, being larger and having greater gun power, prevented the German destroyers from gaining an effective firing position.

A short time later the Eleventh Half Flotilla made an attack on the Battle Cruiser Fleet and Fifth Battle Squadron as they were passing on opposite courses from a position on their beam and distant about 10,000 yards. The number of torpedoes fired is not known, and no tracks were seen by British ships, except that the two torpedoes which passed under the *Nomad* may have been fired by this half flotilla.

D. Attack of Flotillas II and IX and the Twelfth Half Flotilla from 6 to 6.15 p. m.

Flotilla IX and the Twelfth Half Flotilla made an attack on what they believed to be the British Battle Fleet, but which was actually the Third Battle Cruiser Squadron of three ships only. The number of torpedoes fired is not known, for the statement in the official report that each destroyer fired six torpedoes is obviously incorrect. The firing range was about 6,000 yards and the target angle about 240°;

the firing position was therefore unfavorable. Ten torpedoes were sighted by the British, but some of these might have been fired by Scouting Division II. The 10 torpedoes passed the line as follows:

Three close to *Invincible;* one under *Inflexible;* one alongside *Inflexible;* one astern *Inflexible;* two astern *Indomitable;* one under *Indomitable;* one alongside *Indomitable.*

Despite the very small target formation and the unfavorable firing position about 30° abaft its beam, the torpedoes were so well directed that all the target ships were forced to maneuver to avoid torpedoes. In this they were assisted greatly by the fact that the torpedoes were at the end of their run and going very slowly; even at this two torpedoes passed under ships. Apparently the torpedoes ran on parallel courses; had a criss-cross pattern been used, they would have been more difficult to avoid. As it was, the Third Battle Cruiser Squadron was thrown out of action for a time and compelled to draw off at a time when their fire on the German light cruisers would have been very effective.

During a melee at close range between German and British destroyers, one German boat, probably *B–110*, approached to within 1,500 yards of the *Shark*, firing two torpedoes from a position on the beam of the target; one torpedo hit, sinking the *Shark*—which had already been damaged by gunfire—almost immediately.

E. Attack of the "S–32," "V–73," and "G–88" at About 6.35 p. m.

When the German battle fleet countermarched at 6.35 p. m., it was covered by Flotilla III with a smoke screen; the flotilla was then recalled by the first leader of the destroyers in the *Rostock;* but *V–73* and *G–88*, joined by *S–32* of Flotilla I, pushed home an attack to 7,000 yards, broad on the bow of the First Battle Squadron. From this fine position *G–88* and *V–73* each fired one torpedo and *S–32* four. All six torpedoes passed through the target. One hit *Marlborough*, two passed ahead *Marlborough*, one passed astern *Marlborough*, one passed astern *Agincourt*, and one stopped short. This was a fine attack, but the volume of fire was too small; it is unfortunate that the flotilla should have been recalled at such an opportune time for an effective attack.

F. Attack of the Eleventh and Seventeenth Half Flotillas from 7.10 to 7.25 p. m.

These half flotillas fired 21 torpedoes at the Fourth and First Battle Squadrons—16 ships—at a firing range of 7,500 yards; target angle about 80°; target speed about 15. The target squadrons were turned away 45° to avoid the attack, but 19 torpedoes are specifically mentioned as having crossed the target formation, as follows:

1 ahead Iron Duke.	1 ahead Hercules.	1 astern Hercules.
1 close to Colossus.	1 ahead Revenue.	1 astern Revenge.
2 astern Revenue (later).	1 close to Neptune.	2 astern Neptune.
1 alongside Agincourt.	1 alongside Agincourt.	1 ahead Collingwood.
1 astern Collingwood.	1 ahead Marlborough.	1 astern Marlborough.
1 under Marlborough.	1 astern Inflexible.	

Practically all these torpedoes were avoided by maneuvering of individual ships after the torpedo wakes had been sighted. The calm sea rendered it very easy to see the wakes from aloft for great distances. The development of a wakeless torpedo is naturally of great importance.

This attack represents the greatest volume of fire used in the battle. Unfortunately the Seventeenth Half Flotilla had already been engaged twice before and had expended most of their torpedoes; it was able to fire only 10 on this occasion. It is not known why the Eleventh Half Flotilla could not fire more than 11 torpedoes. If it could have been possible for about 60 torpedoes to have been fired in two minutes with a criss-cross pattern extending over one squadron of eight ships in the target—seven and one-half torpedoes per ship—there is no doubt as to the business which would have been done. As it was, the entire rear of the British battle formation was thrown into confusion at a critical time; many ships had miraculous escapes, and one torpedo even passed under the *Marlborough*. The destroyers also undoubtedly saved the German battle fleet from very severe gunfire damage by forcing the enemy to turn away and shift nearly all his fire onto the destroyers and by covering the German battleships with a smoke screen.

G. Attack of "V–73" and "G–88" of Flotilla III from 7.10 to 7.25 p. m.

These two vessels were ordered to go alongside the *Wiesbaden* and rescue the crew of that vessel. Being forced to turn back by the extremely heavy fire which covered them, they each fired two torpedoes at the Fifth Battle Squadron, which then consisted of three ships. Firing range was about 10,000; target angle, 120°; target speed, 15. Despite this unfavorable firing position, all four torpedoes passed close to the *Barham*. The torpedo control was excellent, but, of course, the volume of fire was too small to accomplish any results.

H. Attack of Flotilla III from 7.22 to 7.30 p. m.

While the Eleventh and Seventeenth Half Flotillas were returning from their attack on the Battle Fleet, about eight boats of Flotilla III and *S–32* of Flotilla I came through them as a second attacking wave. By this time the British had turned away and the visibility to the eastward had become extremely poor. As a result the *S–32*

was the only boat to sight them. This venturesome boat, commanded by Lieut. Commander Fröhlich, a name well worth remembering, had already fired four torpedoes in the attack where the *Marlborough* was hit, and was therefore able to fire only one torpedo at 9,000 yards range. The result of this shot is not known. The *S–32* continued to be in the center of the fighting, for she was put out of action by a heavy shell in the engine room during the night action. It is possible that some vessels of Flotilla III fired torpedoes at light cruisers during this attack, but there is no statement to that effect.

I. Attack of Flotilla V from 7.30 to 7.45 p. m.

This flotilla advanced as the third attacking wave. It did not sight the British Battle Fleet, but was engaged with light cruisers, apparently the Fourth Light Cruiser Squadron, which reports that six torpedoes crossed its line, several being very nearly hits. It is possible that more than six torpedoes were fired by this flotilla. The firing range was 8,000 yards and target angle 90°. As the target speed was about 25 knots, it will be seen that the torpedo control of the flotilla was excellent, for the firing conditions were most difficult.

J. Attack of the Twelfth Half Flotilla at 8.30 p. m.

At about 8.30 there are reports of three torpedoes passing the British line at widely spaced intervals—one ahead of *Inflexible*, one ahead of *Iron Duke*, and one close to *Agincourt*, which came to the surface 150 yards short. This apparently was a very long-range attack by the Twelfth Half Flotilla, which is shown in the German sketches to have made an advance at this time. No mention of torpedo fire is made, and the firing data is unknown.

K. Summary of German Attacks.

The German destroyers fired a known total of 65 torpedoes during the day action. Of these about 35, or over half, were fired at small target units of from three to five ships, which greatly reduced the chances of hitting. The firing ranges varied from 6,000 to 10,000 yards and averaged about 8,000. This is excessive, but in most cases the Germans did not have the support of the fire of their capital ships, and the target formations, not being under effective fire, were able to maneuver to avoid the torpedoes; also in some cases British destroyers and light cruisers met the attacking boats before they could close the range sufficiently. In almost all cases the target angle was too great. Instead of being from 50 to 70°, it was frequently greater than 90°, which made the conditions distinctly unfavorable. The commanders of half flotillas exercised

control over the torpedo fire of their boats, and the directing of torpedoes was most excellent, a very large number of torpedoes being sent through the target formation, even when it consisted of but three or four ships. When salvos were fired, the torpedoes apparently ran on parallel courses, and this allowed them to be avoided with greater facility; a criss-cross pattern would have greatly increased the effectiveness of the salvos. But the main defect in the German torpedo fire was the small number of torpedoes fired in salvos. When it is considered that one torpedo hit a capital ship and four others passed under ships—due to no failure of the torpedo control—and that there were many cases where torpedoes missed by only 5 yards, it will be realized that if a really proper volume of fire had been used—about nine torpedoes per 500 yards of target formation—a considerable number of hits would have been made, which might have had a decisive effect upon the battle.

The following conclusions may be developed from the above:

(a) Centralized control of the firing unit should be used.

(b) Torpedoes should be fired in salvos by the firing unit.

(c) Criss-cross pattern should be obtained in salvos.

(d) Volume of fire should be six torpedoes per vessel of the firing unit.

(e) Fire should be concentrated on a part of the target formation such that there will be about nine torpedoes per 500 yards of formation.

(f) Attacks should be supported wherever possible by the gunfire of our battle fleet, so as to prevent the enemy from maneuvering and to keep him from shifting all his fire onto the attacking destroyers.

(g) Firing ranges of 6,000 yards can and should be reached.

(h) The target angle should be from 50 to 70°, depending upon the target's speed, so as to give a track angle of about 100° at the target formation.

IV. TORPEDO FIRE BY DESTROYERS DURING THE NIGHT ACTION.

A. Attack of Eleventh Flotilla on Scouting Division II at 10.05 p. m.

The *Castor* and Eleventh Flotilla encountered a German formation, which was probably the three light cruisers of Scouting Division II. *Marne* and *Magic* each fired one torpedo at a range of about 2,000 yards with a target angle of about 270°. No hits were made. Somewhat latter the *Magic* fired a second torpedo; it did not hit; no firing data is given.

B. Attacks of the Fourth Flotilla from 11.30 p. m. to 12.30 a. m.

At 11.30 the Fourth Flotilla was steaming on course south, speed 17, in single column in the following order: First Half Flotilla. *Tipperary*, *Spitfire*, *Sparrowhawk*, *Garland*, and *Contest;* Second Half Flotilla, *Broke*, *Achates*, *Ambuscade*, *Ardent*, *Fortune*, *Por-*

poise, and *Unity*. The three light cruisers of Scouting Division II, probably followed by *Rostock* and several destroyers, were sighted on the starboard beam, steaming on a parallel course and distant about 800 yards. From this excellent firing position the following torpedoes were fired:

Order in column.	Firing ship.	Torpedoes fired.	Later movements of firing ship.
1	Tipperary	2	Out of action; sank in two hours.
2	Spitfire	2	Separated from flotilla.
3	Sparrowhawk	1	Joined Broke.
4	Garland	1	Joined Achates.
5	Contest	1	Joined Broke.
6	Broke	1	Led Sparrowhawk and Contest.
7	Achates	0	Led Ambuscade and Garland.
8	Ambuscade	2	Joined Achates.
9	Ardent	1	Separated from flotilla.
10	Fortune	0	Sunk immediately.
11	Porpoise	0	Put out of action.
12	Unity	0	Separated from flotilla.

Of the 11 torpedoes fired at this time one hit the *Rostock;* the *Elbing*, while maneuvering to get out of the line of fire of German battleships, attempted to pass through their column and was rammed by the *Posen.*

While the attack was generally successful, the volume of fire was far too small. At least 24 torpedoes could have been fired. Had an equal number of our destroyers found themselves in such a fine firing position, their salvo of 72 torpedoes would certainly have hit all the light cruisers and many of the battleships they were protecting.

The *Unity* took no further part in the night action. The *Spitfire* turned back and tried to assist the *Tipperary*, but was rammed by the *Nassau*, second ship in the German column, and put out of action. The *Ardent* proceeded singly and ran into the leading German battleship division. She fired a torpedo at 500 yards range, which did not hit, and was herself sunk.

Of the remaining six boats, *Broke* led the *Sparrowhawk* and *Contest*, while a short distance in the rear were the *Achates*, *Ambuscade*, and *Garland.*

Only about 15 minutes later the *Broke* encountered the leading German battleship division and was immediately put out of action; her steering gear jambed and she rammed the *Sparrowhawk; Contest* also rammed *Sparrowhawk;* all three boats were out of action and did not fire a torpedo. *Sparrowhawk* sank the next morning.

Shortly after this encounter *Achates* also ran into the leading German battleship division; *Ambuscade* and *Garland* each fired

one torpedo at 1,000 yards range; *Achates* did not fire, as it was feared that British light cruisers were in the line of fire. None of these torpedoes hit; no attacking destroyer was damaged, but they took no further part in the action.

Fourteen torpedoes were fired in these various attacks; one hit was made; two German light cruisers were put out of action and sunk; four destroyers were sunk and four put out of action.

C. Attacks of the Thirteenth Flotilla at 12.15 and 2.35 a. m.

At 12.15 a column of about six destroyers, led by *Narborough*, passed at right angles directly ahead of the leading German battleship division. The *Petard*, next to the rear ship in column, passed only about 300 yards ahead of the first battleship, but unfortunately had fired all her four torpedoes in the day action. She was hit six times. The *Turbulent*, rear ship, was sunk immediately, and it is not known whether she was able to fire torpedoes. The *Pelican*, next ahead of the *Petard*, did not fire torpedoes because the position was considered unfavorable. This was a most unsuccessful encounter, as one destroyer had been sunk and another damaged, without a single torpedo having been fired from a perfect firing position.

At 2.35 the *Moresby* fired one torpedo at a division of four battleships, distant 4,000 yards, target angle about 300°. Apparently the other destroyers in the same formation did not see the enemy and missed a fine opportunity. The torpedo did not hit.

D. Attack of the Twelfth Flotilla at 2 a. m.

The Twelfth Flotilla at 2 a. m. made an attack on the entire German battle fleet on a parallel and opposite course, range 3,000 yards, target angle about 270°. The destroyers were in single column in the following order: Flotilla leader, *Faulknor;* First Division, *Obedient*, *Mindful*, *Marvel*, *Onslaught;* Second Division, *Maenad*, *Noble*, *Nessus*, *Narwhal;* Second Half Flotilla, seven boats.

Torpedoes were fired as follows:

Order in column.	Firing ship—	Number of torpedoes fired.	Order in column.	Firing ship—	Number of torpedoes fired.
1	Faulknor	2	6	Maenad	1
2	Obedient	2	9	Narwhal	2
4	Marvel	4			
5	Onslaught	4			15

The *Maenad* countermarched and made a second attack at 4,500 yards range, firing two additional torpedoes. Of the 17 torpedoes

fired one hit the *Pommern*, exploding her magazine and sinking the ship with all hands.

It will be noted that only 6 boats of the 16 in the flotilla fired torpedoes. Had all fired four torpedoes each, the results would have been much greater. It would appear that the countermarch to bring the attacking destroyers on an opposite course prevented the Second Half Flotilla from firing torpedoes. No effort to repeat the attack and keep touch with the Germans was made. Only one destroyer—the *Onslaught*—was put out of action in this attack.

E. German Night Attacks.

The German destroyers did not gain touch with the British capital ships, but did fire a few torpedoes at light craft.

At 10.45 the *Unity* made contact with three German destroyers, the leader of which fired a torpedo with a target angle of 135° and a firing range of probably about 800 yards. The *Unity* avoided the shot by turning.

At 9.02 the *Garland* sighted four German destroyers, the two leading boats of which each fired one torpedo; the *Garland* was turning through 16 points at the time and both torpedoes passed astern.

At 3.30 a. m. the *G–37*, *G–38*, *G–40*, and *V–45*, having on board the crew of the *Lutzow*, while steaming on a southerly course, made contact with the *Champion*, *Marksman*, and *Maenad* steaming to the northward on an opposite course. While passing at a range of about 300 yards at least two torpedoes were fired at the *Champion*, one passing ahead and the other close astern. *Champion*, while maneuvering to avoid the torpedoes, lost sight of the heavily loaded German boats and allowed them a safe line of retreat.

F. Summary of the Night Torpedo Attacks.

In night torpedo attacks British destroyers made two hits with 35 torpedoes, while the Germans made no hits with 5 torpedoes.

There was no difficulty in reaching a proper firing position. On many occasions British destroyers found themselves in perfect positions without any effort on their part; on others such positions could have been easily gained had an offensive mission been assigned to them.

Priceless opportunities were wasted by destroyers failing to fire torpedoes while in firing positions of advantage and in no case was the volume of fire more than half of what it should and could have been. Destroyers able to fire six torpedoes in a single salvo could probably have made 25 per cent of hits.

The following conclusions regarding night torpedo attacks by destroyers are respectfully presented:

(a) Destroyers making night attacks, if they follow a proper doctrine, have excellent chances for making a large percentage of hits.

(b) Proper firing positions can be gained if unit commanders are inspired with an offensive spirit of getting in close to the target and "marching to the sound of the guns."

(c) Each destroyer should select a single ship as a target and fire its full broadside in salvo at this ship. The second broadside should then be fired. The mission should be to hit the target with three torpedoes.

(d) Some of the torpedoes should be set for a depth so that they will be effective against light cruisers and destroyers—say, 8 feet. They will then also be effective against capital ships.

V. EXCESSIVE DEPTH OF TORPEDO RUNS.

German torpedoes passed under four British capital ships—*Marlborough*, *Inflexible*, *Indomitable*, and *Princess Royal*. All these torpedoes were at the extreme ends of their runs. It would appear that the depth of a torpedo's run increases with the range and at long range reaches such an excessive depth that the target can not be hit.

This defect may be one peculiar to German torpedoes or common to all torpedoes. It goes without saying that it is a question which should be investigated with the greatest care and, if found to exist, should be corrected immediately. Until the alterations are made the depth setting should be decreased to from 6 to 8 feet and the range limited to that at which the actual depth of the torpedo does not exceed 20 feet.

VI. EFFECT OF TORPEDO HITS.

One battleship first line—the *Marlborough*—was hit by a torpedo. Severe damage resulted. A hole 70 by 20 feet was made in the ship's side. The Diesel and hydraulic engine rooms were flooded and two men killed. Water leaked in "A" fireroom and put out the fires under six boilers, reducing the speed to 17 knots. A list of 7½° was put on the ship, but this did not prevent her from remaining in formation and using her main battery with effect. At 2 a. m. speed had to be reduced to about 13 knots and the ship left formation. While returning to port the pump suctions choked and the fireroom was flooded to within 4 feet of the gratings at the top. A diver cleared the suctions and the water was pumped out again. Six weeks' repairs were required; 1,000 men were required for this work and some additional structural alterations.

One battle cruiser—the *Seydlitz*—was hit and also possibly the *Lutzow*. Due to the fact that the *Seydlitz* was very severely damaged by gunfire in the vicinity of the torpedo hit, it is difficult to de-

termine just what damage was caused. It is known that one 5.9-inch gun was put out of action by the shock and that a certain amount of water was admitted to the ship, but as the ship continued in formation at maximum speed for at least three hours after the hit the damage was certainly not comparable to that inflicted on the *Marlborough*. It is impossible to determine the damage caused to the *Lutzow*, if she was hit by a torpedo, which is by no means certain.

One second-line battleship was hit by a torpedo—the *Pommern*. The explosion ignited a magazine and the ship blew up with all hands.

Three light cruisers—*Rostock*, *Frauenlob*, and *Wiesbaden*—were hit with torpedoes. The *Frauenlob* was a very old and small light cruiser and sank immediately with all hands. The *Rostock* was a moderately old light cruiser, and the torpedo caused severe damage, so that the ship could not be maneuvered. It was blown up by the Germans. The *Wiesbaden* probably was not severely damaged by the torpedo hit.

Two destroyers—*Shark* and *V–27*—were sunk immediately by torpedoes.

One destroyer—*V–4*—was sunk by a mine.

The *Ostfriesland* was mined. A hole 12 by 5 meters was made in the side and some water entered. The damage was not severe. One man was killed and nine wounded.

The following conclusions are submitted:

(a) One torpedo will not cause enough damage to a modern battleship or battle cruiser to put her out of action. In fact, the torpedoing at other times of the "Moltke," "Westfalen," "Grosser Kurgurst," and "Kronprinz" shows that one torpedo had practically no effect on a German battleship or battle cruiser.

(b) Second-line battleships and light cruisers will probably be put out of action by a single torpedo. A later action, in which the "Nottingham" and "Falmouth" were torpedoed, indicates that probably three torpedoes will be required to sink a first-line light cruiser.

(c) A single torpedo will sink a destroyer.

(d) One mine will have little effect on a modern capital ship. This is also shown by the mining of the "Goeben" and "Seydlitz" on other occasions.

PART IV.—HANDLING OF NAVAL FORCES IN ACTION.

I. HANDLING OF BATTLESHIP AND BATTLE CRUISER FORCES.

Due to the fact that the British and Germans used different methods of handling their battleships and battle cruisers in action, a comparison of their methods and the results obtained will present much valuable information.

TABLE 26.—*Signals sent by Admiral Jellicoe to his battleship squadron.*

Time.	To—	Signal.	Method.	Course.	Speed.
6.02	Squadrons	Divisions column right 3 points.	Flags	S	20
6.06	do	Divisions column left 4 points.	do	SE	20
6.15	do	Deploy into column on left division.	Flags; radio	SE. by E	20
6.26	do	Speed 14	do	SE. by E	14
6.26	do	Column right 3 points—annulled.	do	SE. by E	14
6.33	do	Speed 17	Flags	SE. by E	17
6.44	do	Column right 1 point	Flags; radio	SE	17
6.55	do	Divisions column right 4 points.	do	S	17
7.05	do	Divisions column right 3 points.	do	SW. by S	17
7.09	do	Divisions column left 3 points.	do	S	17
7.12	First Battle Squadron	Take station astern of Fourth Battle Squadron.	Searchlight	S	17
7.16	Second Battle Squadron.	Take station ahead of Fourth Battle Squadron.	Flags; searchlight.	S	17
7.18	do	Increase speed of engines	Searchlight	S	17
7.18	do	Proceed at your utmost speed	Flags	S	17
7.20	Squadrons	Speed 15	Flags; radio	S	15
7.21	Second Battle Squadron.	Ships left 4 points	Flags	SE	15
7.22	Squadrons	Subdivisions column left 2 points.	Flags; radio	SSE	15
7.25	do	do	do	SE	15
7.35	do	Subdivisions column right 5 points.	do	S. by W	15
7.36	do	Form column	Radio	S. by W	15
7.40	Second Battle Squadron.	My course is southwest	Searchlight	SW	15
7.42	Fourth Battle Squadron.	Column right 3 points	Flags	SW	15
7.52	Squadrons	Admiral has resumed guide	do	SW	15
8.00	do	Divisions column right 4 points.	Flags; radio	W	17
8.14	Second Battle Squadron.	Follow battle cruisers	Searchlight	W	17
8.21	Squadrons	Divisions column left 2 points.	Radio	WSW	17
8.25	do	Divisions column right 2 points.	Flags; radio	W	17
8.28	do	Divisions column left 4 points.	do	SW	17
9.01	do	do	do	S	17
9.17	do	Form line of squadrons, 1 mile.	do	S	17

The following conclusions are deduced from the above data:

(*a*) About nine signals per hour were sent, or about an average of seven minutes between signals.

(*b*) In several cases signals were annulled or counteracted by other signals.

(*c*) For a great part of the action the fleet speed was only 14 or 15 knots; it never exceeded 17 knots.

(*d*) The battleship force was held in a rigid formation throughout, and no initiative was used by squadron commanders. In most cases changes of course by the leading ship of the force were prescribed by the commander in chief in the ninth ship.

(*e*) Maneuvers were usually by changes of course by leaders of division or subdivision columns. No simultaneous maneuvers were ordered, except one for the Second Battle Squadron.

(*f*) General signals to the force were sent usually by both flags and radio; signals to individual squadrons were sent usually by searchlight. Four light cruisers were used for repeating flag signals. All maneuvering signals were received promptly; some signals to individual ships were not received and some were incorrectly received, but in general the fleet communications were excellent.

The Battle Cruiser Fleet and Fifth Battle Squadron, with two exceptions, used column formation and successive changes of course only. The Battle Cruiser Fleet made the approach in two division columns, one of four, the other of two ships. Single column was not formed far enough in advance; as a result the *New Zealand*—fifth ship—did not open fire until 10 minutes after the *Lion*. After forming single column two minutes before opening fire, signal was made for a two-point line of bearing to avoid smoke interference, but column was formed within three minutes after opening fire and maintained thereafter throughout the action. At 6.18 the commander Fifth Battle Squadron signaled for a countermarch to port, but apparently the signal was not executed. The ships, on the initiative of commanding officers, turned left eight points and then, following the *Barham*, turned right eight points; this was a very nice maneuver, far better than the one signaled.

TABLE 27.—*Signals sent by Vice Admiral Scheer to the battleship force.*

Time.	Signal.	Remarks.
4.45	Distribute fire from the right	
4.46	Open fire	
4.53	Increase speed	To pursue Beatty's force.
4.59	Divisions column left 2 points	Not executed by Division 5.
5.06	Divisions column right 2 points	
5.16	Divisions column left 2 points	Division 5 had already turned to left.
5.20	General chase	This gave entire initiative to squadron and division commanders.

TABLE 27.—*Signals sent by Vice Admiral Scheer to the battleship force*—Con.

Time.	Signal.	Remarks.
5.24	Increase speed	
5.48	Leading ship take guide	This gave the initiative to the commander of the leading squadron.
5.49	Reduce speed	To reassemble battleship force.
5.55	Increase speed	
6.18	Divisions column left 2 points	
6.20	Leading ship take guide	
6.35	Ships right about	To withdraw from disadvantageous position.
6.38	Course west	
6.47	Divisions column right 2 points	
6.55	Ships right about	
7.00	Reduce speed	To allow ships to rectify positions.
7.17	Ships right about	To withdraw.
7.21	Course west	
7.26	Course southwest	
7.50	Course south	

The following conclusions as to the German methods of handling a battleship force may be drawn from the above data:

(*a*) About seven signals were sent an hour, or about one every 8½ minutes.

(*b*) Practically all the signals were of a general character; a rigid formation was not insisted on at any time, and squadron and division commanders used wide initiative in handling their commands. Nevertheless (the commander in chief retained entire control over the force at all times, and on three occasions executed "ships right about," an extremely difficult maneuver. The commander of the leading squadron repeatedly made changes of course on his own initiative.

(*c*) Battle orders were sent by both flags and radio. Flag hoists were shown from both masts.

The German battle cruisers were maneuvered with beautiful precision throughout the battle, even after they had received heavy damage and all their signal and radio gear had been shot away. They made no less than 26 simultaneous changes of course during the battle.

The following conclusions are respectfully presented:

(a) Too much attention can not be given to tactical exercises and in particular to the maneuvering of the battleship force. The Germans had drilled for years to an extent never attempted by other navies, and their extraordinary proficiency in handling their battleship force certainly saved the High Sea Fleet from receiving very severe damage in unfavorable positions.

(b) Rigidity of formation should not be required; flexibility is more important, and liberal initiative should be allowed to squadron and division

commanders in handling their commands. The commander of the leading squadron should lead the force on his own initiative in so far as changes of course in succession are concerned.

(c) Usually battle movements should be by division columns, but ships right or left about is a practicable and most advantageous maneuver. We will be throwing away a great advantage if we are unable to use this maneuver under even the most unfavorable conditions.

(d) Detached divisions should use simultaneous maneuvers.

(e) Battle orders should be sent by radio and flag hoists on both masts; screening destroyers should act as repeating ships for flag signals.

(f) Speed should be maintained as high as practicable and, exact position keeping not being required, speed should not be reduced for this purpose.

(g) A minimum of battle orders should be used in action, and no other signals which might interfere with them should be sent.

II. HANDLING OF LIGHT CRUISER FORCES.

With the exception of the *Chester*, *Canterbury*, and vessels detailed as leaders of the destroyer units and as repeating ships for the battleship force, all light cruisers were operated in squadrons or divisions of four or five ships each. These divisions were under the direct orders of either the commanders of the scouting forces or the commanders in chief; there were no officers detailed specially to command all the light cruisers or two or more divisions of such vessels. The division of four ships is therefore the tactical unit.

Both commanders in chief realized that it would usually be impracticable to control the light cruiser forces by signal in battle, and therefore these units were operated almost entirely on the initiative of their commanders. This is considered a correct principle.

There are but a few instances where orders were issued to light cruiser units. During the German destroyer attack at 7.22 the British commander in chief ordered the Fourth Light Cruiser Squadron to " prepare to attack the torpedo vessels of the enemy. Proceed at your utmost speed." A minute later they were warned not " to get in the way of firing of battle cruisers." Nine minutes afterwards they received a second warning: " Do not get too near enemy's battle fleet."

At 8, during a long lull in the action, the senior officer, Battle Cruiser Fleet, ordered the First and Third Light Cruiser Squadrons to " sweep to the westward and locate the head of the enemy's line before dark."

As far as is known the German light cruisers received no instructions during the battle.

British light cruisers were maneuvered almost altogether by changes of course in succession. The Germans used both changes

in succession and simultaneously, but preferred the latter method of maneuvering.

Light cruisers were well utilized in the action as follows:

British.

First Light Cruiser Squadron:

At 8.20 located and reported the German Battle Fleet. This division succeeded in passing through a column of battleships without collision.

Second Light Cruiser Squadron:

At 4.00 formed scouting line ahead of the Battle Cruiser Fleet.

At 4.30 supported with one ship the British destroyer attack.

At 4.38 reported the approach of the German Battle Fleet, with their formation, course, and speed; fired one torpedo at German battleships and avoided for over an hour the gunfire of a large number of battleships at moderate range by zigzag tactics.

At 7 reported the movements of the German Battle Fleet which were unseen by any other forces.

At 8.30 and 9.00 repelled the attacks of German destroyers.

At 10.30 carried on a close-range engagement with a German Light Cruiser Division and sank one light cruiser with a torpedo.

Third Light Cruiser Squadron:

At 6.40 attacked the head of the German Battle Cruiser Division with guns and torpedoes at moderate range.

At 8.20 located and reported the German Battle Fleet and engaged a division of German light cruisers.

Fourth Light Cruiser Squadron:

At 7.30 repelled German destroyer attack and dodged torpedoes.

At 8.30 and 9.00 fired torpedoes at German Battle Fleet at moderate range.

German.

Scouting Division II:

At 4.00 avoided the fire of the Fifth Battle Squadron at long range without being hit.

At 5.40 put the *Chester* out of action.

At 6.00 supported German destroyer attack and fired torpedoes at what was supposed to be the British Battle Fleet. Made an erroneous report to this effect to the commander in chief.

At 7.00 supported with the battle cruisers German destroyer attacks.

At 11.30 repelled the attack of the Fourth Flotilla with severe losses. In passing through the German battleship column the *Elbing* was rammed and later had to be sunk by the Germans.

Scouting Division IV:

At 8.30 engaged the Third Light Cruiser Squadron.

At 10.30 engaged the Second Light Cruiser Squadron and inflicted severe losses on two ships.

The following conclusions may be presented for the handling of light cruisers in battle:

(a) The tactical unit should be a division of four ships.

(b) Divisions should operate directly under commander of the battle or scouting fleet.

(c) As it will be impracticable for directions to be issued to light cruisers during an action, these units should be operated on the initiative of the division commanders, and fleet commanders should not intervene except in cases of emergency or when a lull in the action gives them an opportunity for regrouping their forces.

(d) Light cruisers should be prepared to use both simultaneous and successive changes of course; the former method will usually be more satisfactory.

(e) Light cruisers of 5,000 tons are far more effective in a fleet action than cruisers of 10,000 tons, due to their great maneuvering ability, the small target they present and their excellent battery of quick firing hand loading guns, all of which should be mounted on the center line.

III. HANDLING OF DESTROYER FORCES.

The normal British destroyer organization consisted of flotillas of four divisions of four boats each, but there were only three flotillas which had all four divisions present; in two of these flotillas several boats were missing.

In two flotillas all divisions operated directly under the flotilla commander, who was in a light cruiser. Both these light cruisers were so slow that they were unable to accompany the destroyers at all times, and the flotilla commanders were able to exert very little control over their divisions.

In three flotillas a half-flotilla organization was used, the half-flotilla consisting of two divisons. The flotilla commander commanded the first half flotilla in a special flagship; in two flotillas it was a destroyer leader; in one it was a light cruiser; the flotilla commander in this case was also in charge of all the destroyers with the title of "Commodore, Grand Fleet Flotillas." He did not actually exercise any command outside his own flotilla. The second half flotilla had a destroyer leader in all three cases as a flagship for its commander.

The German tactical unit was a flotilla of 11 boats—two half flotillas of five boats each and one flotilla leader, which was of the same type as the other destroyers. Three flotillas were grouped under one commander in the light cruiser *Regensburg*; this group operated with the Scouting Fleet. Three and a half flotillas were grouped under another commander in the light cruiser *Rostock*; this gronp operated with the battle fleet.

During the battle-cruiser action Admiral Beatty exercised considerable control over the operations of his destroyers, ordering the 4.30 attack and later directing one flotilla to form an antisubmarine screen around the Battle Cruiser Fleet. The attack at 4.30 was a free-for-all affair. The flotilla commander in the *Champion* exerted

no control whatever, and divisions were handled at will by their commanders; soon even the divisions were mixed up, and it required the initiative of the commanding officers to make a success of the attack. No attempt was made by division commanders to control torpedo fire.

The attack of the destroyers accompanying the Third Battle Cruiser Squadron at 6 was carried through by the initiative of the division commander, and the fine work of the commanding officers made the attack a success.

The splendid attack of the *Onslow* was made on the initiative of the commanding officer.

Admiral Jellicoe ordered the battle-fleet destroyers, six minutes before deployment, to take up destroyer disposition No. 1. Instructions then in force probably prevented destroyer attacks without specific orders, for no orders were issued and no attacks were made. At 7.40, when the Twelfth Flotilla was just getting into action with German destroyers, it was recalled by the commander in chief in two peremptory signals.

The Germans used an excellent system of controlling destroyer operations, and the wishes of the commander in chief were completely obeyed. Through signals and the intelligent indoctrination of the destroyer forces he was able to exercise complete control over the destroyers at all times. The two destroyer commanders in light cruisers contributed to this result.

The commander of Flotilla IX was already attacking at 4.30 on his own initiative when the second leader of destroyers in *Regensburg* ordered him to attack so as to relieve the pressure on the battle cruisers. The *Regensburg* then entered the destroyer action herself, leading the Third Half Flotilla as a reinforcement. Shortly afterward the commander, Flotilla VI, leading the Eleventh Half Flotilla, attacked on his own initiative.

The attack by Flotilla IX and the Twelfth Half Flotilla were made on the initiative of the flotilla commanders when the Third Battle Cruiser Squadron was mistaken by them for the battle fleet.

The making of the smoke screen by Flotilla III at 6.35 was perfectly timed. It is not known who issued the order for the laying of this screen. The initiative of *G–88 and V–73* of this flotilla in pushing home the attack after having been recalled by the first leader of destroyers in the *Rostock* was very fine, as was also that of the commander, Flotilla I, in joining them with his flagboat. This flotilla had but one-half flotilla present, and the flotilla commander was therefore not required with his own flotilla.

The great successive attacks at 7.30 were ordered by the commander in chief, but were carried out by the first leader of the

destroyers in the *Rostock*. Two half flotillas advanced in the first wave, two flotillas came on in the second line, and two more were ready in reserve. The boats held together by flotillas and half flotillas.

During the night no orders or instructions were issued to the British destroyers except that they were to remain 5 miles in rear of the battle squadrons. There was no attempt at cooperation between flotillas, although this was easily possible. There was no control of flotilla or division commanders over their own divisions, except in the case of the Twelfth Flotilla, and even here it was very slight. The only results accomplished were due to the initiative of commanding officers, which in some cases was excellent. In the morning no vessels of the flotillas were in the vicinity of their battle fleet.

The German destroyers after dark were ordered to attack in definitely assigned sectors, but did not show initiative in pushing on in advance of their battle fleet a sufficient distance; consequently, they did not locate the British battle fleet. Had they done so, we would now probably know much more about night torpedo attacks. In the morning all the flotillas were with their battle fleet except the Second Flotilla, which was granted permission by the second leader of destroyers to return to port via the Skagerrak.

The following conclusions are presented:

(a) Most of the German attacks were made by units which corresponded to one of our divisions; some attacks were made by forces slightly less than two of our divisions. It is therefore probable that our squadron of 19 boats is too large to be a tactical unit. This should therefore be the division. In some cases the division will be too large, and we should therefore be trained to operate by sections.

(b) Our destroyers will not operate with maximum efficiency until we have a destroyer leader for each squadron and possibly for each division.

(c) The squadron is a useful unit for holding destroyers in a position of readiness for attack and for initiating an attack which must be carried through by divisions. The squadron is a fine unit for night search and attack, because a scouting line can be formed with two divisions or three sections, leaving the remaining force as a striking group.

(d) For each task group of approximately two squadrons there should be a light cruiser, first line, as a flagship for the group commander. This vessel preferably should not exceed 5,000 tons, so as to be able to maneuver with the destroyers and present a small target.

(e) The system of command should be a combination of orders and initiative based on indoctrination. General orders should be signaled by the commander in chief for attacking and laying smoke screens to cover our own fleet. The general methods for this attack and the units designated to attack should be ordered by the task group commanders in light

cruisers. The attack should be initiated by squadron commanders and carried through by division commanders. When divisions break up, commanding officers then should push home the attack. Division organizations may not last longer than the firing of the first broadside, and in this case the firing of the second broadside rests upon the commanding officers. Nothing, however, should prevent, in the absence of instruction, unit commanders from taking any of the above measures except the laying of smoke screens while the fleet is engaged. This was the German system which worked so effectively. Commanding officers must remember that the 12 torpedoes they carry may well decide the result of a fleet action.

IV. SMOKE SCREEN TACTICS.

The battle proved that the smoke screen is one of the most important tactical features of a fleet action. It was repeatedly used with effect by destroyers, light cruisers, and even battle cruisers. The British used funnel smoke alone, but as the German ships almost all burned coal which is not so suitable for making the usual form of smoke screen, they supplemented this with what was known as "Hoechst artificial fog."

A smoke screen has three principal uses:

(*a*) To cover an attack of destroyers or light cruisers.

(*b*) To permit the retirement of all classes of ships from an unfavorable position or an action against superior enemy forces.

(*c*) To blank off a portion of the enemy battle line, so that the remainder may be concentrated upon by our entire line.

The third use was not employed by either side during the battle, but the other two uses are illustrated by many examples.

The Germans used smoke screens as follows:

(*a*) At 4.00 Scouting Division II covered themselves with artificial fog so as to enable them to escape from the gunfire of the Fifth Battle Squadron.

(*b*) At 4.35 Scouting Division I used artificial fog according to British reports in order to reduce the effectiveness of the gunfire of the Battle Cruiser Fleet and the Fifth Battle Squadron, which were far superior in fighting power. The British state that the fog made their targets very indistinct.

(*c*) At 6.00 Scouting Division II made artificial fog and smoke to cover themselves from the Third Battle Cruiser Squadron. This did not prevent the *Wiesbaden* and *Pillau* from being hit.

(*d*) At 6.10 the *Wiesbaden* used artificial fog, which completely hid the ship from the *Warrior* and prevented effective gunfire.

(*e*) At 6.40 Flotilla III laid smoke and artificial fog, and the *Lutzow* laid the latter in order to allow Scouting Division I and the Battle Fleet to withdraw from a very unfavorable position. This practically saved the *Lutzow* and *Derfflinger*, because both of them were unable to proceed, due to their torpedo nets hanging over their propellers. It also served to cover the effective attack of *S–32*, *G–88*, and *V–73*.

(*f*) At 7.20 the Eleventh and Seventeenth Half Flotillas laid smoke screens which covered the Battle Fleet and Scouting Division I while withdrawing from under an effective fire and concealed their retirement from the enemy. It also assisted the attack of these half flotillas and that of the Flotillas III and V which followed. As concrete instances of the results of this smoke screen the *Iron Duke* was forced to cease firing at a battleship and prevented from opening fire on a battle cruiser; the *Marlborough* was forced to cease fire on a battleship while hitting her heavily; the *Collingwood* had to cease firing on the *Derfflinger* when hitting; and the *Monarch* was prevented from commencing fire on a battle cruiser. This screen did very much toward saving the German Battle Fleet.

(*g*) At 7.45 Flotilla III covered the badly damaged ships of Scouting Division I and forced the Battle Cruiser Fleet to cease firing.

(*h*) At 8.24 the Twelfth Half Flotilla covered themselves from the gunfire of the Fourth Light Cruiser Squadron.

The British used a smoke screen only once—at 9.10, when the Fourth Light Cruiser Squadron covered themselves from the gunfire of the battle fleet while escaping after having made an attack with torpedoes.

The use of a smoke screen by attacking destroyers was practised by our destroyers many years before Jutland and was a well-known operation. The principal lesson of the battle was the defensive use of the smoke screen to cover the battle fleet and light craft when it is necessary to disengage. The use of the screen is a certain method of disengaging any force from even the most unfavorable positions practically without losses or damage. Screening destroyers will usually cover the battle fleet; light cruisers and destroyers must be prepared to cover themselves. Smoke screens should usually be employed only upon signal from the commander in chief, for if used at an inopportune time they may impose on their own ships very grave disadvantages. The navy which knows the proper use of the smoke screen for all occasions will have a great advantage in the next fleet action over its less trained opponents.

V. DIFFICULTY IN DISTINGUISHING SHIPS DURING THE DAY ACTION.

The ability to distinguish ships in a day action is an important tactical factor, particularly if the visibility is low. The mist and smoke made it impossible to distribute fire by the counting method, or to distinguish individual enemy ships; it was often impossible to tell even the class of enemy vessels, and there were numerous cases where it was impossible to distinguish friend from foe.

The *Royal Oak* and *Superb* state that there was great difficulty in distinguishing friend from foe; the captain of the *Thunderer* was not able to distinguish anything from the bridge and had to rely upon reports from aloft; the *Derfflinger* for a time mistook the

Defense for the *Rostock;* Admiral Beatty, upon sighting the *Minotaur*, asked what ship it was; the *Hampshire*, withheld her fire on the*Wisbaden* at 9,500 yards range until her challenge was incorrectly answered; and the *Vanguard* did not know that the German Battle Fleet was present in the battle.

There were three very notable instances which might have had important results. The first was the meeting of the Second Cruiser Squadron and the Third Battle Cruiser Squadron at about 6 p. m. "At about 5.50 p. m.," writes the captain of the *Minotaur*, "several vessels, two of them large, were seen in the mist bearing down upon us. On receiving no reply to the challenge, we altered course to port so as to bring them abaft the beam, and repeated the challenge. Receiving no reply to this, I ordered the starboard battery to open fire, but almost immediately received a report from the top that they could recognize one of the vessels as the 'Invincible' class, and almost at the same time a ship come through the mist and I recognized her myself."

The second case was the very grave error of the commander, Scouting Division II, when at 6.10, having sighted the Third Battle Cruiser Squadron, he reported it as being the entire Battle Fleet. This deceived Admiral Scheer at the time and apparently was not known in the German Navy for many months after the battle.

The third case was a most remarkable one and resulted in a radical difference of opinion between the vice admiral, Second Battle Squadron, on one side, and the commander, Fourth Light Cruiser Squadron and the commodore of the flotillas, on the other. "I should like to mention specially," reports the vice admiral, "that about 9 p. m. I negatived an attack with Whitehead torpedoes ordered by *Caroline*, as I was certain that the vessels seen on our starboard beam were our own battle cruisers. The navigating officer of my flagship, who has just come from the Battle Cruiser Fleet, was certain that they were ours and saw them sufficiently clearly to give their approximate course, which I reported to you. Shortly afterwards I told *Caroline* to attack if he was certain they were enemy ships, as he was in a better position to see them than I was, but I do not know whether an attack was made."

The other side is stated by the commodore (F): "At about 9 p. m. the Battle Fleet turned, leaders together, to south, the flotilla remaining on starboard bow of Second Battle Squadron, and a line of battle cruisers was then sighted on the starboard quarter closing the fleet. They appeared very much like enemy battle cruisers, but by an intercepted signal from vice admiral, Second Battle Squadron, to the commodore, Fourth Light Cruiser Squadron, the vice admiral,

Second Battle Squadron, was apparently satisfied they were our own. Soon after sighting them these battle cruisers opened fire on two of the Fourth Light Cruiser Squadron ahead of the Flotilla. I turned the flotilla away from the battle cruisers, and expected the fleet to open fire on them. The leading battle cruiser then fired a star shell, which appeared to justify the opinion that they were enemy ships; but as the fleet still held their fire I could not attack, as it was not dark enough to make an attack unsupported by fire from the fleet."

The result of this misunderstanding was that the *Caroline* and *Royalist* fired two torpedoes at the formation in question, which was probably a German battleship division, while the destroyers and Second Battle Squadron missed an opportunity to attack with torpedoes and guns, respectively.

While these incidents demonstrate the difficulty of distinguishing ships even in a day action, a remedy for these conditions is more difficult to determine. Certain steps, however, may assist in a solution of this problem:

(a) Careful study of the silhouettes of our own and enemy ships.

(b) Careful study as to the appearance of our own ships in low visibility, noting in particular distinct differences in the appearance of our ships from those of other navies.

(c) A system of recognition signals which is distinctive and positive during daylight as well as at night.

(d) The use of a system of keeping our ships informed of the movements of our detached forces and enemy forces with which contact may be expected.

(e) Radiocompasses might be of value in this respect.

(f) The avoiding of a concentration of two parts of the fleet during an action, particularly in low visibility. The Germans had much less trouble in this respect, because they were assembled in one more or less compact mass before the visibility decreased and the British Battle Fleet came into action.

VI. DIFFICULTY OF RECOGNITION AT NIGHT.

Admiral Jellicoe mentions as one of the reasons why he decided against a night action the impossibility of distinguishing between friend and foe at night. He also states that the German system of recognition signals was far superior to that of the Grand Fleet and counts this as an important advantage for the Germans.

As the problem of distinguishing friend from foe is probably the most important one for night fighting, the various encounters after the battle will be examined in some detail.

A. Contact of "Castor" and Eleventh Flotilla with the Enemy at 10.04 p. m.

At 9.32 Admiral Beatty asked the *Princess Royal* by blinker or searchlight: "Please give me challenge and reply now in force as they have been lost." He was signaled the information requested. The *Castor* and *Manners* saw the above signals being made, and as they were in close contact with the Germans there is a possibility that the latter also took in the signals.

At 10.04 the *Castor*, then leading eight boats of the Eleventh Flotilla, sighted German cruisers, probably Scouting Division IV and *Seydlitz*, about 2,500 yards on the starboard bow. The enemy challenged with British recognition signals, which were partly correct. *Castor* apparently made the reply, and then the enemy turned on searchlights and opened fire. *Castor* and two destroyers fired torpedoes, but the other six boats believed that they were being fired on by British cruisers and did not fire.

B. Encounter Between Second Light Cruiser Squadron and Scouting Division IV.

These two divisions were within sight of each other on slightly converging courses for some time before fire was opened. Some British officers thought the ships sighted were German, but others considered that they might be the 3d Light Cruiser Squadron. When the two lines were only about 800 yards distant, Southampton challenged with blinker and the Germans answered with their usual display of colored lights on their fore yardarms. Both forces commenced firing together.

C. Contact of Fourth Flotilla with Scouting Division II and Battle Fleet.

At 9.50 p. m. the *Tipperary* exchanged recognition signals with a British light cruiser division. At 11.30 a column of three light cruisers was seen on the starboard beam coming in on a slightly converging course. As is apparent from the statements of officers of the *Broke*, *Spitfire*, *Sparrowhawk*, and *Achates*, the flotilla knew nothing of the British dispositions, except that they were following the Battle Fleet. This fact, together with the fact that they had just passed British light cruisers, caused great uncertainty in the minds of commanding officers throughout the entire encounter. The *Sparrowhawk* reported the strange vessels to the captain (D), who replied that he considered them to be the First Light Cruiser Squadron. However, when the range decreased to about 1,000 yards, he challenged and was answered by a salvo which put the ship out of action.

Most of the British destroyers then took this as proof that the ships were hostile, but both the captain and executive of the *Broke*

still thought the cruisers were British and withheld torpedo fire for some time. Then the forward tube was not fired because the officer in charge thought that the enemy were going in the opposite direction. *Achates* also canceled the order to fire torpedoes, because it was thought that the cruisers were British. The *Garland* a few minutes later sighted a German battleship and thought it was British, but soon afterwards the German ship displayed colored lights and this gave the *Garland* an opportunity to fire a torpedo.

D. Contact of Thirteenth Flotilla with Battleship Division II.

About eight destroyers found themselves ahead of the leading division of the battle fleet. The *Petard* at once recognized the ships to be German by their cranes and could have fired torpedoes had all not been expended. The German ships displayed colored lights. A destroyer turned on his fighting lights, and then the Germans opened fire. The destroyers had a splendid opportunity to fire torpedoes between the time the Germans made recognition signals and opened fire.

E. Attack of Twelfth Flotilla on the Battle Fleet.

The flotilla knew very little of the dispositions of the Grand Fleet and when at 1.43 a long line of ships was sighted there was doubt as to their identity; this was dispelled by the Germans flashing "K," which was not the correct British challenge. While the flotilla lost contact temporarily with the enemy, they soon relocated them and had several torpedoes in the water before they had been discovered and brought under fire. The use of recognition signals by the Germans in this case assisted the British.

F. Two Contacts of the "Moltke" with British Battleships.

At 10.30 the *Boadicea*, which was proceeding 500 yards in rear of the *Thunderer*, the last battleship of the Second Battle Squadron, sighted a large ship approaching at high speed about two points abaft the starboard beam. The *Thunderer* also made out this ship and considered her a cruiser. The strange ship was the *Moltke*, which challenged three times by switching on a display of four horizontal red lights above four green ones. The *Thunderer* did not open fire on account of disclosing the position of the battle fleet, and the *Boadicea* did not have time to fire a torpedo before the *Moltke* turned away and disappeared.

At about 12.30 the *Revenge* and *Fearless* sighted a ship or ships to starboard. Th *Revenge* at first thought it was destroyers, and the order to open fire with the 6-inch was given; this order was countermanded when it was seen that it was a large ship. Then she was

challenged by blinker and made the wrong reply. However, by this time the strange ship, which was the *Moltke*, had sheered off and disappeared before fire could be opened.

G. Conclusions.

(a) In so far as is practicable our fleet should be so disposed as will prevent contacts between our own vessels at night.

(b) Our own ships should maintain, if practicable, the same course, so that if contacts are made this will indicate that the ships are friendly.

(c) At dark all ships should plot the positions of all friendly vessels in sight; if the course and speed is the same for all ships during the night these positions will be the same. The commander in chief should either issue an operation order giving the fleet formation or should indicate the positions of detached forces which are liable to make contact with other portions of the fleet.

(d) A distinctive and unusual method of sending recognition signals by both visual and radio should be worked out during peace, but not installed until war is declared, so that it may be kept secret. A form of challenge which will not be recognized as such by a hostile force should be used.

(e) While judgment must be used in every case as to the procedure upon sighting a strange ship at night, it is almost always better to let him make the challenge, as this discloses his identity while yours is still unknown, and allows you to take the initiative, either to attack or retire. If a challenge which will not be recognized as such can be used, then it would be correct to challenge first.

(f) Every effort should be made to determine the system of recognition signals used by the enemy; our ships should be fitted with such systems, as this will frequently allow us to resort to ruses with effect.

(g) Any ship seeing an enemy challenge should broadcast this information to the fleet so that other ships may use it when making contact with probable enemy forces.

(h) A ship wishing to gain time should immediately repeat the enemy challenge, so as to make her think we were making the challenge simultaneously, or should make some reply by the enemy's system, which might be partly correct, and at any rate will raise a doubt in the minds of the enemy.

(i) In case many contacts are made during one night, the commander in chief should issue a new recognition signal unknown to the enemy.

VII. USE OF RADIO COMPASS BEARINGS.

No ships present in the action were fitted with radiocompasses, but the British shore stations were used very effectively for plotting the position of German ships which used radio.

Approximately correct positions of the following units were furnished the commander in chief:

2.31 p. m.—One light cruiser and one destroyer.
4.30 p. m.—German Battle Fleet.
9.00 p. m.—Rear ship of German Battle Fleet.
Midnight—Lutzow.
2.30 a. m.—Battle Fleet.
3 a. m.—Light cruiser.

The commander in chief received these positions about one hour after the sending of the German radio dispatches which were used for fixing them.

If such valuable results can be obtained by shore stations distant several hundred miles, it is evident that radiocompasses on ships will be used to still greater effect in the next campaign. The training of radio personnel in the use of the compass is an important feature in preparation for war.

As practically all vessels are now fitted with radiocompasses, it follows that radio silence at sea is even more important than before. Messages which must be sent by capital ships should be relayed by visual to a light cruiser or destroyer for forwarding by radio.

VIII. DECIPHERING OF ENEMY DESPATCHES.

One of the most remarkable incidents of the battle was the fact that many German messages were deciphered by British shore stations and their contents relayed to the commander in chief, to whom they must have been of utmost value.

The following is a summary of the various messages deciphered:

5.45 p. m.—Enemy main force at 4.30 p. m. 56° 3′ N., 6° 5′ E., steering north, 15 knots.

9.55 p. m.—Three destroyer flotillas have been ordered to attack you during the night.

10.41 p. m.—Enemy fleet believed to be returning to its base as its course is S.SE. ¾ E., and speed 16 knots.

1.48 a. m.—Enemy submarines apparently coming out from German ports and a damaged enemy ship, probably *Lutzow*, was in lat. 56° 26′ N., long. 5° 4′ E., at midnight.

3.12 a. m.—German light cruiser in 55° 45′ N., 6° 25′ E., damaged, crew taken off; destroyers standing by at 3 a. m.

3.29 a. m.—Urgent. At 2.30 German main fleet in lat. 55° 33′ N., long. 6° 50′ E., course SE. by S., 16 knots.

5.30 a. m.—*Elbing* still afloat at 3.47, without crew.

9.17 a. m.—At 6.20 enemy submarines ordered to close *Elbing;* position now given lat. 55° 5′ N., long. 5° 55′ E.

On the German side the radio decoding station at Neumunster was able to partially decipher British messages to the effect that the Grand Fleet at Scapa had put to sea.

It is not known whether treachery or merely the painstaking work of cipher experts was responsible for the breaking of the German cipher, which was probably put in effect only with the sailing of the High Sea Fleet, which sent no radio messages up until the time of sighting hostile forces.

We should take the following steps in war:

(*a*) *Change the code and cipher frequently and always before beginning an important operation.*

(*b*) *Use the least amount of radio possible and reserve the more secret codes for the sighting of enemy forces and other important communications.*

(*c*) *Have on board our flagship a group of cipher experts for deciphering enemy despatches.*

IX. ACCURACY IN NAVIGATION.

A comparison between the positions of forces given on the official sketches of the battle and the latitude and longitude positions reported by despatch during the battle allows us to examine the accuracy of navigation of forces in battle.

TABLE 28.—*Accuracy in navigation of H. M. S. "Lion."*

Time.	Bearing of reported position from actual position.	Distance between reported and actual positions.
3.21	103° (true)	4.3 miles.
3.40	90° (true)	4.1 miles.
3.45	95° (true)	5.1 miles.
3.55	355° (true)	1.7 miles.
4.45	84° (true)	10.5 miles.

This table shows the following:

(*a*) The first three positions show a considerable, but not excessive, constant error.

(*b*) The fourth position indicates a clerical error or other careless mistake, as it is 1½ miles to the westward of the third position, although the *Lion* was steaming to the eastward at 25 knots.

(*c*) There was an excessive error in the fifth position.

TABLE 29.—*Accuracy in navigation of H. M. S. "Southampton."*

Column 1.	Column 2.	Column 3.	Column 1.	Column 2.	Column 3.
4.30	74	11.8	5.40	135	9.8
4.38	87	17.2	5.55	126	13.6
4.48	95	15.8	6.03	119	12.8
5.00	99	13.7			

This table shows the following results:

(*a*) From 4.30 to 4.38 the reported positions show the *Southampton* steaming 8 miles.

(*b*) From 4.48 to 5.00 nine miles were made good.

(*c*) In the entire period covered by the reports, one hour and thirty-eight minutes, 52.5 miles were steamed, counting only the shortest distances between positions reported. This gives a speed of at least 34 knots. The *Southampton* reported her speed as 26 knots.

As during the battle cruiser action both the *Lion* and *Barham* had all radio put out of action, the *Southampton* was the only remaining flagship to report the positions of the enemy. As these enemy positions were in error as much as 17 miles, it will be seen that the junction of the Battle Cruiser Fleet with the Battle Fleet was bound to result in great confusion.

The following measures would seem to reduce errors in reporting the positions of the enemy:

(a) If practicable, have all the force in visual touch so that positions may be reported by bearings and distances.

(b) If forces are out of visual touch, have all ships in sight before an action. Report positions and take the mean for use in reporting positions of the enemy. Repeat this during lulls in the action.

(c) Have one officer on each flagship assigned to the exclusive duty of keeping the track of the ship; have him send the ship's position to the radio room every five minutes, so that this can be coded and kept ready to insert in the contact report.

X. INTERFERENCE, MASKING OF GUN AND TORPEDO FIRE, AND COLLISIONS IN THE FLEET.

All through the accounts of the battle are reports of some ships interfering with others, of ships masking the gun and torpedo fire of other vessels, of collisions, and a great number of narrow escapes from being rammed.

At 3.50 p. m. the destroyer antisubmarine screen prevented the Fifth Battle Squadron from opening fire on Scouting Division II.

At 4.10 the *Lydiard* and *Landrail* interfered with the fire of the Battle Cruiser Fleet.

There was considerable confusion in the destroyer attack at 4.40 p. m. The *Pelican*, *Narborough*, and *Morris* were prevented from firing torpedoes by other destroyers being in the line of fire.

The concentration between the Battle Cruiser Fleet and Battle Fleet between 5.45 and 6.45 resulted in very grave confusion at a critical time. A few of the incidents cited in British reports are given below:

(*a*) 5.50—Light cruisers prevented *Duke of Edinburgh* from opening fire.

(*b*) 6.00—First Light Cruiser Squadron prevented from carrying out its orders to attack with the torpedo due to interference by First Cruiser Squadron.

(*c*) 6.15—Great confusion occurred when destroyers of two fleets met; several boats of Twelfth Flotilla had to back to avoid collision.

(*d*) 6.15—First Light Cruiser Squadron was forced to go through column of right wing battleship division at 27 knots.

(*e*) 6.15—*Black Prince* crossed bows of *Falmouth*, nearly causing collision.

(*f*) 6.15—*Duke of Edinburgh* passed between *Yarmouth* and *Birkenhead*, causing *Birkenhead* and *Gloucester* to change course and lose the formation.

(*g*) 6.15—Fourth Light Cruiser Squadron and First Cruiser Squadron went through line of Third Light Cruiser Squadron. "There was handling of ships," writes an officer of the *Falmouth*, "at full speed in that 10 minutes of crossing the battle fleet's front such as had never been drempt of by seamen before, and that no ship was lost by collision speaks volumes for the skill of commanding officers.

(*h*) 6.15—*Orion* was prevented from firing on *Wiesbaden* by the First Cruiser Squadron.

(*i*) 6.15—*Monarch* was unable to open fire due to the *Defense* and *Warrior* being in the line of fire.

(*j*) 6.15—The *Lion* and *Princess Royal* were forced to change course to miss the First Cruiser Squadron and lost touch with the enemy they were firing on.

(*k*) 6.20—The entire Battle Fleet was forced to reduce speed to 14 knots to allow the Battle Cruiser Fleet to clear the range and to allow cruisers and destroyers to get clear of the van of the battle line; *Marlborough* had to reduce to 8 knots and the *St. Vincent* to stop.

(*l*) 6.20—The entire Sixth Division was prevented from opening fire by the Battle Cruiser Fleet masking them.

(*m*) 6.21—The *Active* was in the way of destroyers.

(*n*) 6.25—The *Conqueror* and *Iron Duke* both masked the fire of the *Thunderer* and prevented her from firing on a battleship.

(*o*) 6.30—The ships of the Fifth Battle Squadron were overlapping and affording the Germans a fine target.

(*p*) 6.32—*St. Vincent* masked *Neptune*.

(*p*) 6.33—*Iron Duke* masked fire of *Thunderer* when hitting.

(*r*) 6.40—*Colossus* hauled out of line.

(*s*) 6.45—Two flotillas were jammed between Second Cruiser Squadron and Second Battle Squadron and were only saved from collision by reduction in speed.

By 6.45 the deployment of the Grand Fleet had been completed, but still some confusion existed, and this was increased due to the maneuvering of the rear battle squadrons to avoid torpedoes. Instances of confusion reported by ships at this time are as follows:

(*a*) 6.50—*Canterbury* unable to fire torpedoes at German battle cruisers due to British light cruiser being in the line of fire.

(*b*) 6.51—*King George V* had to change course to starboard to avoid collision with the Fourth Light Cruiser Squadron.

(*c*) 7—*Vanguard* was masked by *Colossus* and unable to fire on *Derfflinger;* reports that she was masked for practically entire action.

(*d*) 7—Fourth Light Cruiser Squadron masked Thirteenth Flotilla.

(*e*) 7.10—Fire of *Ajax* on battle cruiser masked by Fourth Light Cruiser Squadron.

(*f*) 7.20—*St. Vincent* overlapped *Neptune* in avoiding torpedoes.

(*g*) 7.21—*Orion* unable to fire on destroyers, as light cruisers and destroyers masked the range.

(*h*) 7.27.—*King George V* had to alter course to starboard to avoid light craft; *Duke of Edinburg* interfered with smoke.

(*i*) 8.30—*Birmingham* unable to fire on destroyers because the range was masked by British destroyers.

At 10.04 the *Castor* during her action with German cruisers narrowly missed ramming a destroyer of the Eleventh Flotilla.

During the encounter of the Fourth Flotilla with Scouting Division II at 11.30 p. m., there were a number of collisions: The *Broke* rammed the *Sparrowhawk*, the *Contest* rammed the *Sparrowhawk;* the *Garland* nearly rammed the *Sparrowhawk;* the *Achates* almost collided with the *Broke;* the *Elbing* was rammed by the *Posen*, which ship lost her position in the formation; the *Nassau* rammed the *Spitfire*, which ship was nearly hit a few minutes later by the *Black Prince;* Scouting Division II masked the fire of the German Battle Fleet. The Fourth Flotilla was thrown into complete confusion.

In the attack of the Twelfth Flotilla the *Mindful* was masked by the *Obedient* and another destroyer, which forced her to avoid a collision and prevented torpedo fire. The First Half Flotilla, in countermarching, ran into the Second Half Flotilla and prevented the latter from firing any torpedoes.

All the above facts have been set forth in detail to show the difficulty of handling great fleets in action so that some units or vessels do not interfere with others and decrease the fighting effect of the fleet. A certain amount of interference is impossible to avoid, be-

cause all types of ships, which operate in different ways and use different weapons, can not fight in the same area without decreasing the effectiveness of each other's measures to exert pressure on the enemy.

A few general principles may be suggested:

(a) A concentration of two forces while engaged with the enemy is certain to cause confusion.

(b) A fleet should not be in too close formation, but the various units should be spread out so that they will have maneuvering room. Light forces in particular should keep well clear of the battleship divisions, except for screening destroyers, and it may well prove necessary to have them get well clear of the battleships before fire is opened.

(c) Unit commanders and commanding officers must be carefully indoctrinated in tactical principles and the various instructions covering the conduct of a fleet action.

(d) Maneuvers with large forces using battle speeds are required to instruct unit commanders and commanding officers in the handling of their commands to prevent interference and avoid collisions.

XI. MANEUVERING TO AVOID TORPEDOES.

The fact that torpedoes being sighted while still at a considerable distance from the target could be avoided almost with certainty by the maneuvering of the individual ship toward which they are approaching was one of the most important lessons of the battle. It must be remembered, however, that this maneuvering threw the battle line into considerable confusion and resulted in the masking of the gunfire of many ships; most of the ships turned away, and had the commander in chief wished to turn toward the enemy these ships could not have regained their positions for a long time, and would have been put out of the action.

The following table shows the available information on this subject. Where a ship is marked thus " **," it is considered that one or more torpedoes would have hit had not the maneuver been made.

TABLE 30.—*Instances of maneuvering to avoid torpedoes.*

Time.	Ship.	Number of torpedoes.	Seen.	Turn made.	Where torpedoes passed.
6.10	Invincible **	3	.....	Away	No data.
6.10	Inflexible **	2	.....	Toward	7 yards to port; astern.
6.10	Indomitable **	3	.....	Away 45°	20 yards alongside; 30 astern.
6.39	Tiger	1	.....	.....	No data.
6.45	Marlborough	1	.....	.....	Do.
7.08	Agincourt **	.....	Aloft	.....	10 yards astern.
7.10	Marlborough **	3	.....	Toward and away.	2 yards ahead; 1 astern.
7.10	Neptune	1	Aloft	.....	No data.
7.30	Collingwood **	2	Bridge	Away 50°	10 yards astern; 30 ahead.

TABLE 30.—*Instances of maneuvering to avoid torpedoes*—Continued.

Time.	Ship.	Number of torpedoes.	Seen.	Turn made.	Where torpedoes passed.
7.35	Agincourt **	2	Aloft	Away 90°	50 yards starboard; 50 port.
7.35	Hereules **	2	do	Away 66°	50 yards starboard; 40 ahead.
7.35	Colossus	1		Away	No data.
7.35	Revenge **	2		do	10 yards ahead; 20 astern
7.43	Revenge	2		do	Both torpedoes astern
8.25	Agincourt	1			100 yards from ship.
8.31	Benbow	1		Toward	No data.
6.47	Duke of Edinburgh	1	Aloft	do	50 yards astern.
3.25	Champion	2			20 yards ahead; 20 astern.
10 45	Unity	1	Bridge	Toward	No data.

The following suggestions are offered:

(*a*) *At least four reliable petty officers should be detailed as lookouts for approaching torpedoes; they should be stationed in the tops and should be under the supervision of an officer in the foretop who is specifically detailed to this duty in action.*

(*b*) *The torpedo lookout officer is responsible for reporting to the bridge all torpedo wakes sighted and for making recommendations as to changes of course to avoid the torpedoes. When the torpedo is close aboard or when its wake can not be seen from the bridge, this recommendation should be accepted by the captain as correct.*

(*c*) *A change of course away is usually preferable in a battle line under fire, as it will result in the masking of only the ship maneuvering, whereas, if she turned toward the enemy, a number of ships in the battle line might be blanketed in turn and her smoke might interfere with others.*

(*d*) *It is a possibility that wakes of torpedoes may be made invisible or much less visible than at present; in the preliminary actions of a naval campaign our ships at which torpedoes are fired should take particular care to observe and report on the character of the enemy's torpedoes.*

XII. MANEUVERING TO AVOID GUNFIRE.

Just as torpedoes can be avoided by maneuvering divisions or squadrons and even more effectively by allowing the individual ships to maneuver when they sight torpedo wakes, so gunfire can be avoided both by the maneuvers of squadrons and individual ships.

Admiral Beatty reports that during the battle cruiser action he changed the course of the Battle Cruiser Fleet at intervals to confuse the fire control of the enemy. The many radical maneuvers made by the Germans undoubtedly had the effect of confusing the British fire-control parties, although it is not stated that they were made primarily for this purpose. It is true that such maneuvers

interfere with our own fire-control parties also, but not to the same extent as it does to the enemy.

But it was the maneuvering of individual ships which Jutland proved to be so effective. This measure was used with complete success by battle cruisers, light cruisers, and destroyers. The usual plan was to steer for the splashes of the last salvo in the hope that the enemy would make a spot and thus cause the next salvo to miss. This method effected the range when the course of the target was at right angles to the line of fire and the deflection when it was parallel to the line of fire. If a course intermediate between these extremes was steered, both range and deflection would be effected, but in a lesser degree.

Maneuvering to avoid gunfire was first used by the destroyers of the Thirteenth Flotilla in making good their escape from under heavy gunfire. "I put it down unhesitatingly," writes an officer of the *Nicator* in telling of his escape, "to the way in which the captain handled the ship, and I think everyone else on board thought that too. His idea was, and it undoubtedly saved us, to chase each salvo—that is to say, when a salvo fell short he would alter course to starboard toward it, so that after the German had applied an 'up' spotting correction and fired another salvo, instead of hitting us, it would go over. Then we would alter course to port where the salvo fell, and so on."

The most remarkable example of this system was its use by the Second Light Cruiser Squadron from 4.45 until 5.45, during all of which time they were under an extremely heavy fire.

"I attributed our escape," writes Etienne of the *Southampton*, "as far as we were able to contribute toward it, to the very clever manner in which our navigator zigzagged the ship according to where he estimated the next salvo would fall. It was possible to forecast this to a certain extent, as it was obvious that the Huns were working what is technically known as a 'ladder'—that is to say, the guns are fired with an increase of range to each salvo until 'the target is crossed,' and then the range is decreased for each salvo until the splashes are short of the target once again. It is thus a creeping barrage which moves up and down the target. The best way to avoid it is to sheer toward the enemy when the groups of tall splashes are coming toward the ship, and as soon as they have crossed over and begin once more to come toward the ship, then reverse the helm and sheer away from the enemy."

The *Nottingham* gives an exactly similar description of the method of maneuvering used by that ship. The *Birmingham*, on the other hand, states that the range was usually correct, but that a similar system of zigzagging threw out the deflection. The *Chester*

somewhat later in the action also attributes her escape from the German light cruisers to throwing out their deflection.

The Germans were also familiar with this technical measure, for the commanding officer of the *Seydlitz* states that he used it with great effect at 7.15 p. m.

The following suggestions are made:

(a) That unit commanders under a heavy and accurate fire should make slight changes of course from time to time to confuse the enemy's fire control and prevent him from keeping the rate of change, as was done by the Battle Cruiser Fleet. It is considered that such changes of course, being known to our ships, decrease the effectiveness of our gunfire less than that of the enemy will be reduced.

(b) That light cruisers and destroyers should consider it a part of their doctrine to zigzag by changing course toward the splashes of the last salvo whenever they are under a markedly superior enemy gunfire.

(c) On the other hand, suitable measures should be taken to reduce the effectiveness of zigzag tactics when used by the enemy. This may be accomplished possibly by artificially increasing the dispersion of salvoes when firing under such conditions or by trying to outguess the enemy by ceasing to spot for a series of three or four salvos in the hope that the enemy will maneuver toward them and run into the center of impact. The first measure is supported by the opinions of many British officers who used zigzag tactics that the dispersion of the German salvoes was too small and this assisted them in avoiding them.

XIII. MISCELLANEOUS FACTS, OPINIONS, AND SUGGESTIONS.

Both the commander in chief, High Seas Fleet, and the commander, First Battle Squadron, report that radio was invaluable for the transmission of tactical orders and that it never failed.

Neither British nor Germans were able to jam each other's radio.

Both *Blanche* and *Bellona*, repeating light cruisers, report that in the thick of the engagement it was difficult to see flag signals.

There were a few errors in the reception of dispatches, and in one case a wrong call was used. Two important dispatches from a captain (*D–12*) reporting the position of the High Seas Fleet at 2 a. m., 1 June, were not received.

The following vessels erroneously reported submarines where none were present: Senior officer Battle Cruiser Fleet: *King George V;* Senior officer Fourth Light Cruiser Squadron: *Inflexible; Duke of Edinburgh*—also opened fire; *Hampshire—Hampshire* and *Shannon* opened fire; *Marlborough; Princess Royal; Inconstant; Black Prince; Cordelia; Garland*—several submarines; captain (*D–4*): *Centurion*—two. These reports caused a great deal of unnecessary confusion and anxiety. All such reports should be carefully checked before being made.

During the night attack of the Fourth Flotilla the torpedo men at the forward tube of the *Broke*, having his torpedo director set for a parallel course of the target, decided that the enemy was going on an opposite course and was unable to fire due to the time used in resetting his director; naturally such a shot would have been a complete failure if fired. This emphasizes the necessity of taking into account your own motion when estimating the course of the target at night; because the target draws aft is no proof that it is going on an opposite course.

Many destroyers mentioned the throwing overboard of confidential books; it would appear desirable to supply each ship with one or more heavily weighted sacks, into which all confidential books could be placed before going into action; the sacks could be kept on the bridge and it would be a simple matter to throw them overboard in case there was a possibility of their falling into the hands of the enemy.

At 5.55 p. m. the *Vanguard* made the following note: "A ship on starboard bow (probably German) flashing by signal 'IAR' ('Stop engines')—Vocabulary Signal Book No. 2." Should this have been a German ship, which is improbable, it would mean that a signal book which had only very recently been brought into effect had fallen into the hands of the enemy.

The *Vanguard* reports that she could have very effectively assisted the Second Light Cruiser Squadron at 10.30 by firing at the German light cruisers illuminated by its searchlights; the *Vanguard* was probably about 4,000 yards distant from the Second Light Cruiser Squadron.

The aircraft tender *Campania* accompanied the battle fleet to sea, but was ordered to return to its base at 4.37 a. m., 31 May. No reason is stated.

The British signaled at noon the percentage of fuel on hand; it is considered that this is more useful for the purpose of operations than the number of tons or gallons on hand.

On four occasions before the sighting of the first German ships the senior officer, Fifth Battle Squadron, warned the vessels under his command as to the excessive smoke they were making. The senior officer, Battle Cruiser Fleet, once invited attention to the excessive smoke made by the First Battle Cruiser Squadron. The importance of this will be realized when it is recalled that the smoke of the German battle cruisers was seen and reported long before the vessels themselves were sighted.

On one occasion before entering the battle the commander in chief warned the *Royal Oak* that her gunfire would be ineffective unless a steadier course was steered.

Gas masks were used very effectively on the German ships. They should be supplied to all naval vessels and the personnel instructed in their use.

The Germans used the following distances between ships in the battle line: Day cruising, 700 meters; day battle, 500 meters; night battle, 600 meters. These distances appear to be correct. Admiral Schmidt recommended that the day battle distance be made 600 meters.

The Germans considered that their 1,500-ton destroyers were too large and costly to use in day destroyer attacks. While this might have been true in the North Sea, for operations in which the entire German Navy was designed, it is hardly true in our case, where destroyers require greater steaming endurance and better sea-keeping qualities.

The torpedo nets of the German battle cruisers on one occasion nearly fouled the screws and compelled the stopping of all engines until the nets could be cut away. Following the battle all torpedo nets were removed.

Several officers stated that in order to keep up the morale of the men below decks it was necessary to keep them informed of the course of the action and the various successes won.

The *Derfflinger* kept up her gunfire when it was impossible to see the target merely to maintain the morale of the crew.

CONCLUSION.

It is believed that practically all the features of a fleet action have been covered. It is considered that the facts, with some possible exceptions, are in the main correct. There remain the conclusions. There are two possible sources of error regarding them:

(a) They may be incorrectly drawn from the facts.

(b) The conditions under which the action was fought might be considered exceptional, and even though the facts of the battle support the conclusions they might not apply to a future fleet action under radically different conditions.

Every one must make this judgment for himself. If this is done, the main purpose of this paper—the stimulation of interest in fleet battle tactics—will have been accomplished.

JUTLAND

LIEUT. COMMANDER
H. H. FROST
U. S. NAVY

REVISED AND ENLARGED
JUNE, 1923

Figures 25, 26, 27, and 29, following, have been altered in minor respects to conform to recent tracings prepared at the Naval War College. They embody information obtained from a study of Volume III of Corbett's "Naval Operations," which serves to clear up some of the loose ends in the night action.

85976—24——7

Orders of British Admiralty -30 May.

1. On 30 May, probably during the forenoon, the Admiralty received news which pointed to early activity on the part of the High Sea Fleet.

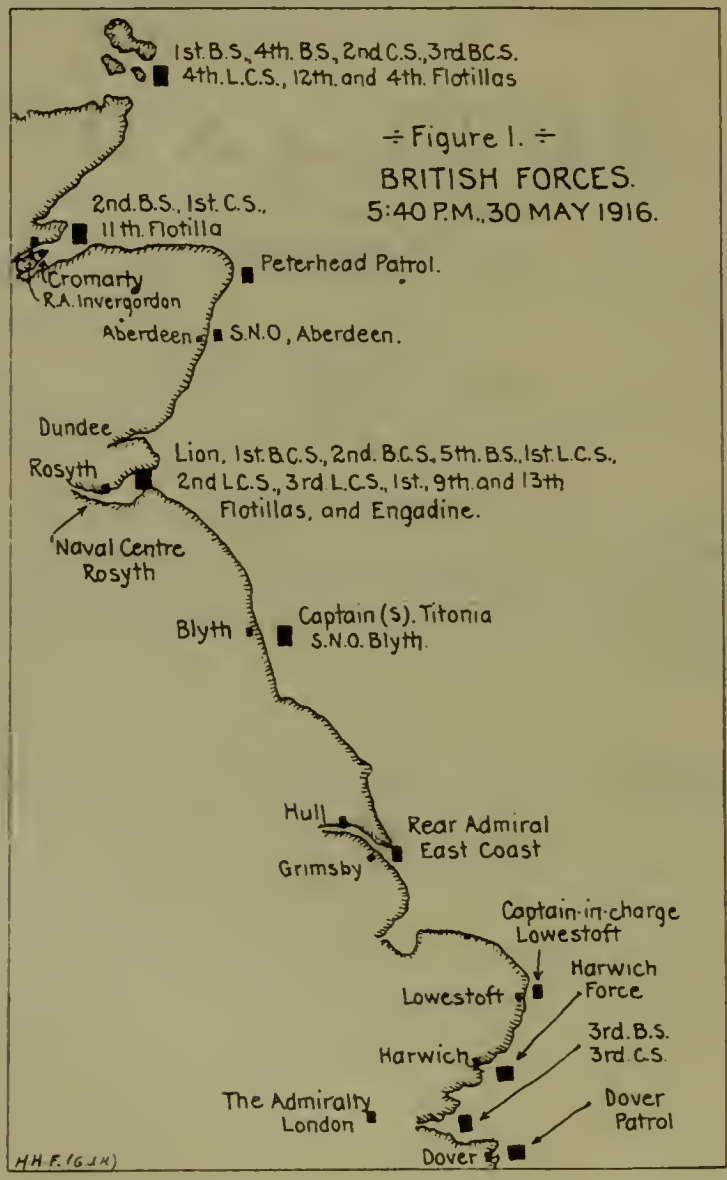
2. About noon the Admiralty ordered the Commander Dover Patrol to send the Harwich destroyers back to Harwich and to recall the Belgian coast patrol; the R.A. East Coast to recall minesweeping sloops; the 3rd B.S and 3rd C.S. to have steam ready by daylight of the 31st; the submarines of the Harwich Force to be ready on short notice.

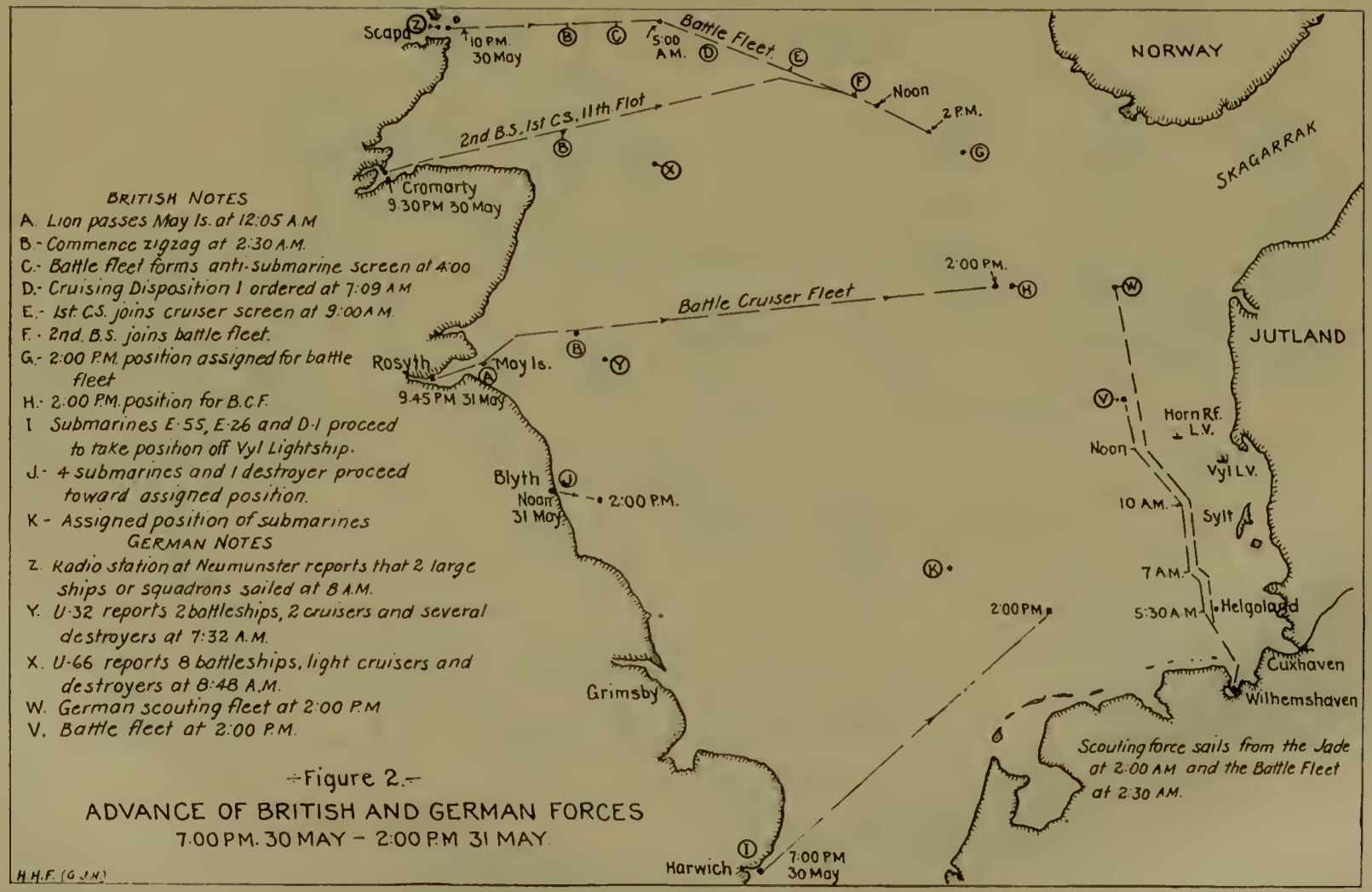
3. At 5:40 p.m. the following message was sent to C in-C, G.F. at Scapa: "You should concentrate to Eastward of Long Forties, ready for eventualities."

4. At 5:40, S.O. 2nd B.S. made "Preparatory signal for leaving Cromarty"

5. At 5:40 C-in-C. G.F. made "Preparatory signal for leaving Scapa."

6. At 5:45 S.O. B.C.F. made signal: "Raise steam for 22 knots."




Scapa
10 P.M. 30 May
Battle Fleet
5:00 A.M.
Noon
2 P.M.
2nd B.S., 1st C.S., 11th Flot
Cromarty
9:30 P.M. 30 May
NORWAY
SKAGARRAK
2:00 P.M.
Battle Cruiser Fleet
JUTLAND
Rosyth
May Is.
9:45 P.M. 31 May
Horn Rf. L.V.
Noon
Vyl L.V.
10 A.M.
Sylt
Blyth
Noon 31 May
2:00 P.M.
7 A.M.
5:30 A.M.
Helgoland
2:00 PM
Cuxhaven
Wilhemshaven
Grimsby
Scouting force sails from the Jade at 2:00 A.M. and the Battle Fleet at 2:30 A.M.
Harwich
7:00 PM 30 May
BRITISH NOTES
A. Lion passes May Is. at 12:05 A.M.
B.- Commence zigzag at 2:30 A.M.
C.- Battle fleet forms anti-submarine screen at 4:00
D.- Cruising Disposition 1 ordered at 7:09 A.M.
E.- 1st. C.S. joins cruiser screen at 9:00 A.M.
F.- 2nd. B.S. joins battle fleet.
G.- 2:00 P.M. position assigned for battle fleet
H.- 2:00 P.M. position for B.C.F.
I Submarines E-55, E-26 and D-1 proceed to take position off Vyl Lightship.
J.- 4 submarines and 1 destroyer proceed toward assigned position.
K - Assigned position of submarines
GERMAN NOTES
Z. Radio station at Neumunster reports that 2 large ships or squadrons sailed at 8 A.M.
Y. U-32 reports 2 battleships, 2 cruisers and several destroyers at 7:32 A.M.
X. U-66 reports 8 battleships, light cruisers and destroyers at 8:48 A.M.
W. German scouting fleet at 2:00 P.M.
V. Battle fleet at 2:00 P.M.
H.H.F. (G.J.H.)

-Figure 2.-

ADVANCE OF BRITISH AND GERMAN FORCES

7:00 P.M. 30 MAY – 2:00 P.M. 31 MAY

A.-- Battle Fleet - Jellicoe.
Battleships 24
Battle Cruisers 3
Light Cruisers 12
Cruisers 8
Destroyers 51

B.-- Battle Cruiser Fleet - Beatty.
Battleships 4
Battle Cruisers 6
Light Cruisers 14
Destroyers 27
Seaplane Carrier 1

Y-- Battle Fleet - Scheer
Battleships 1st. line ...16
Battleships, 2nd line 6
Light Cruisers 6
Destroyers 33

Z.-- Scouting Force - Hipper
Battle Cruisers 5
Light Cruisers 5
Destroyers 32

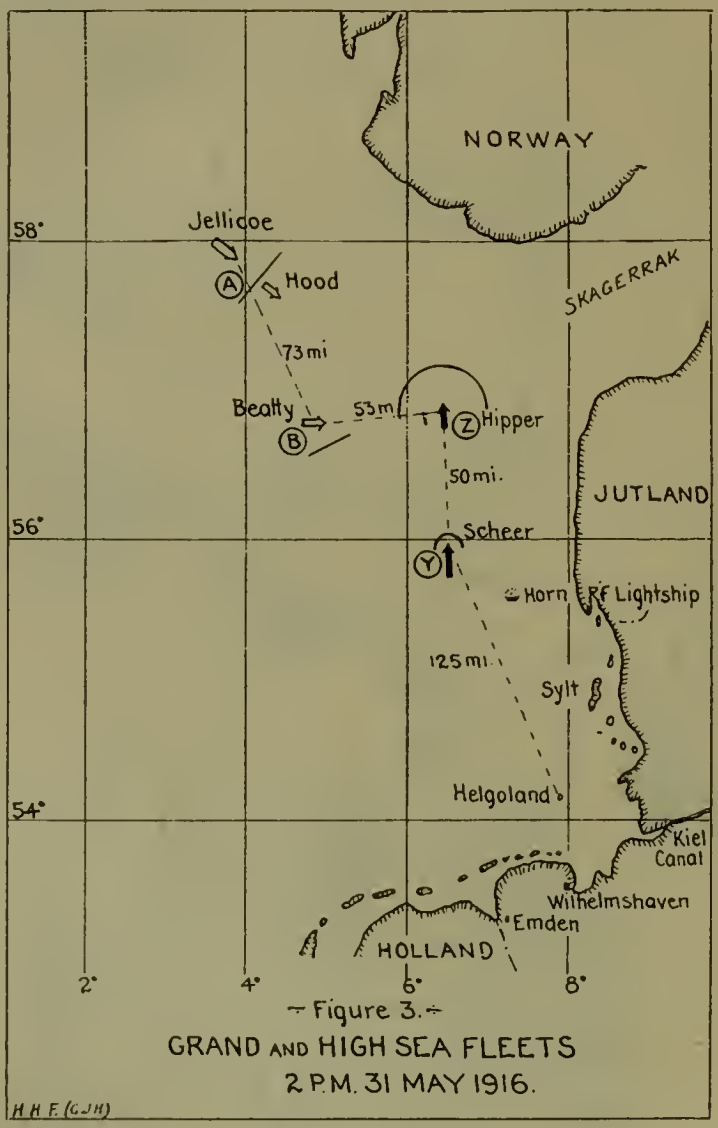
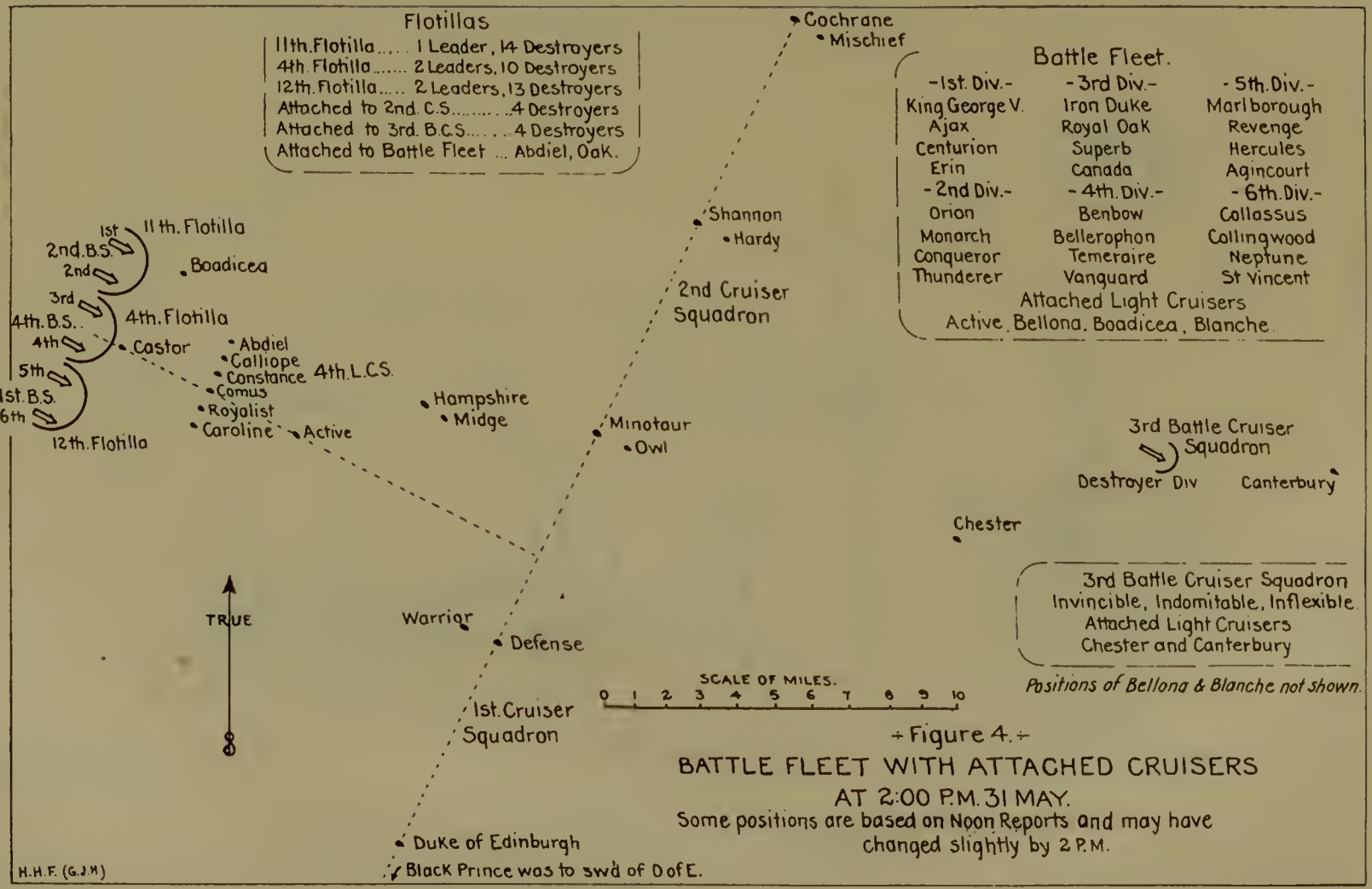


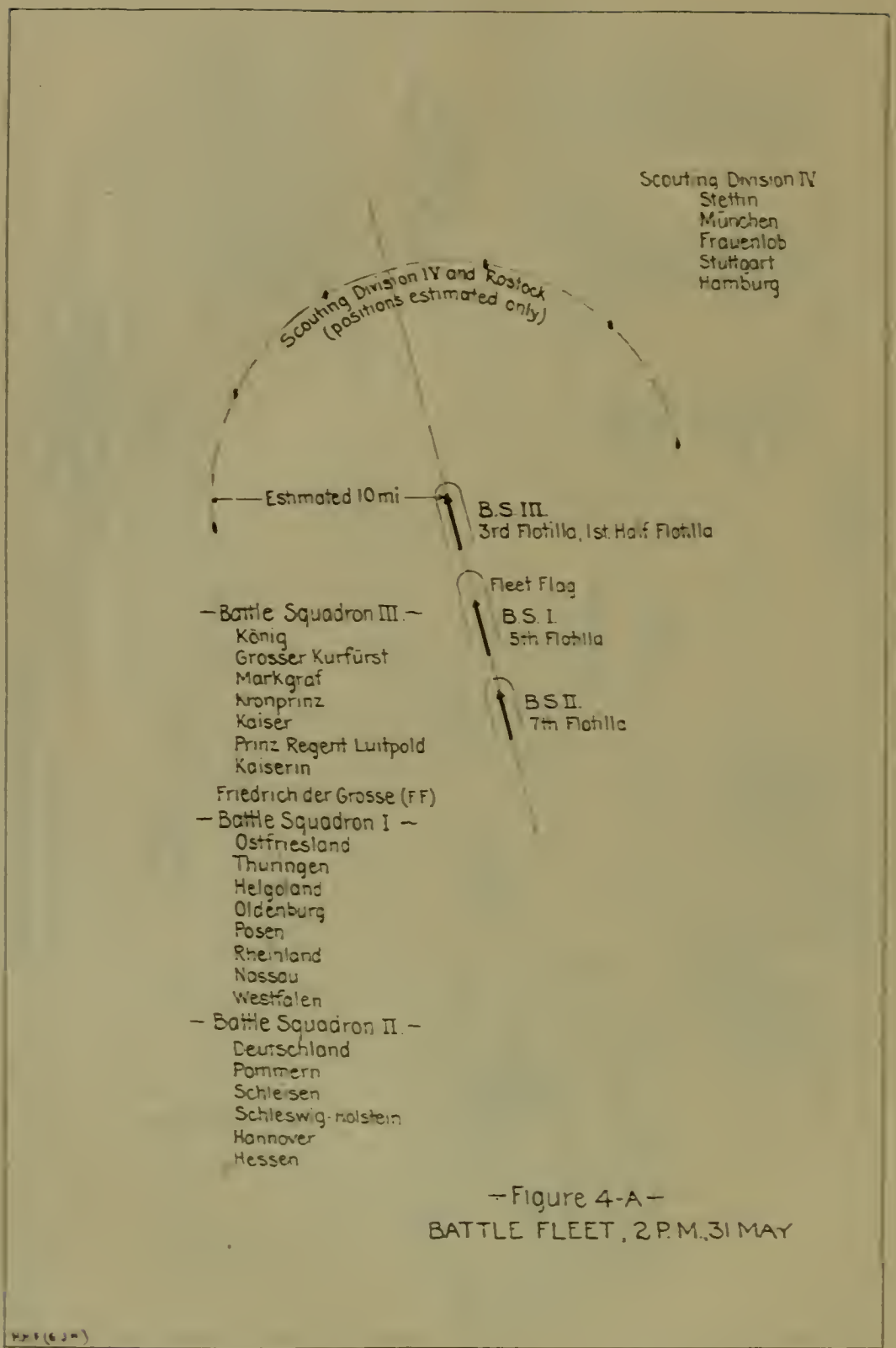
Figure 3.

GRAND AND HIGH SEA FLEETS
2 P.M. 31 MAY 1916.

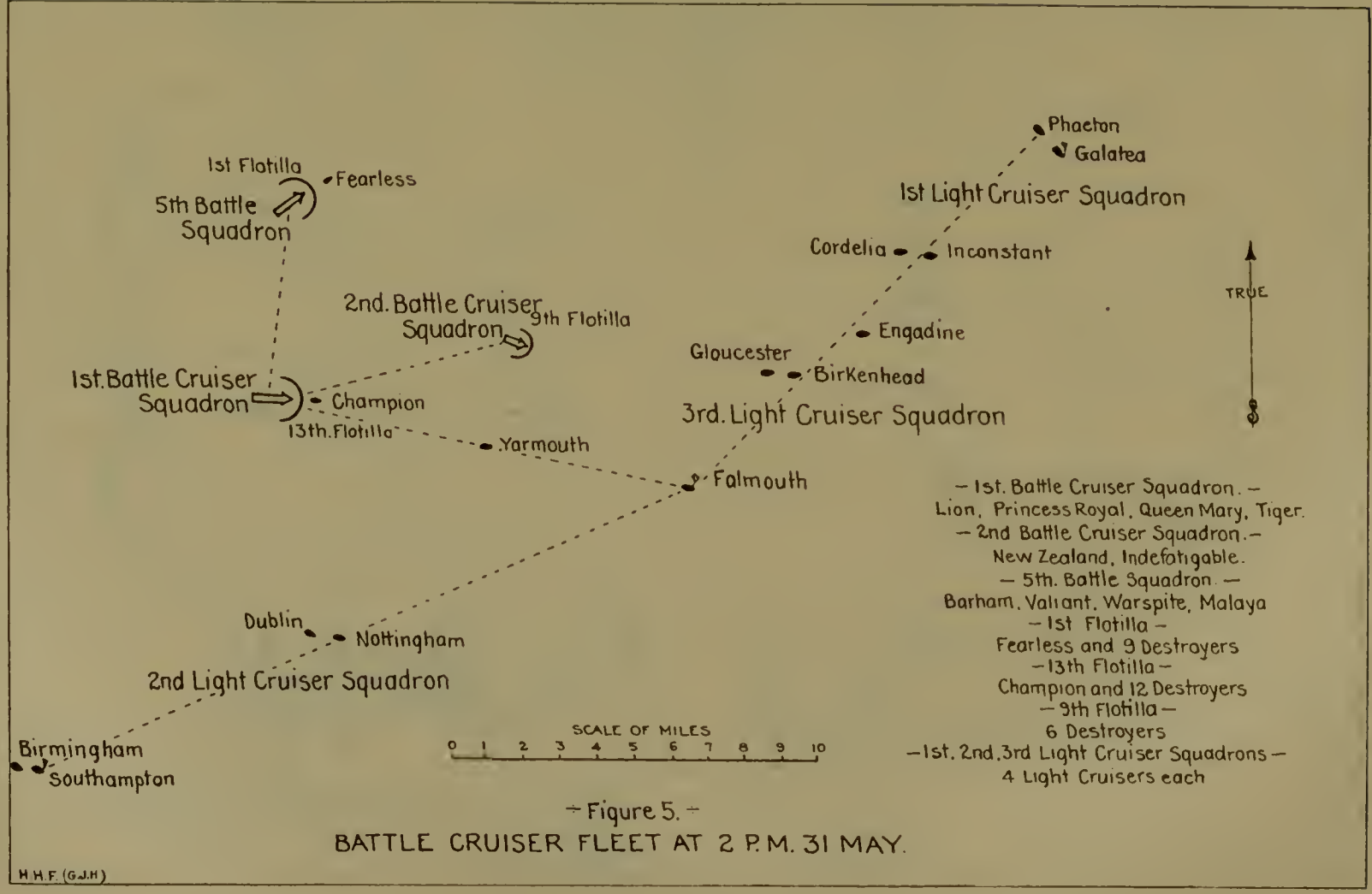


÷ Figure 4. ÷

BATTLE FLEET WITH ATTACHED CRUISERS
AT 2:00 P.M. 31 MAY.
Some positions are based on Noon Reports and may have changed slightly by 2 P.M.

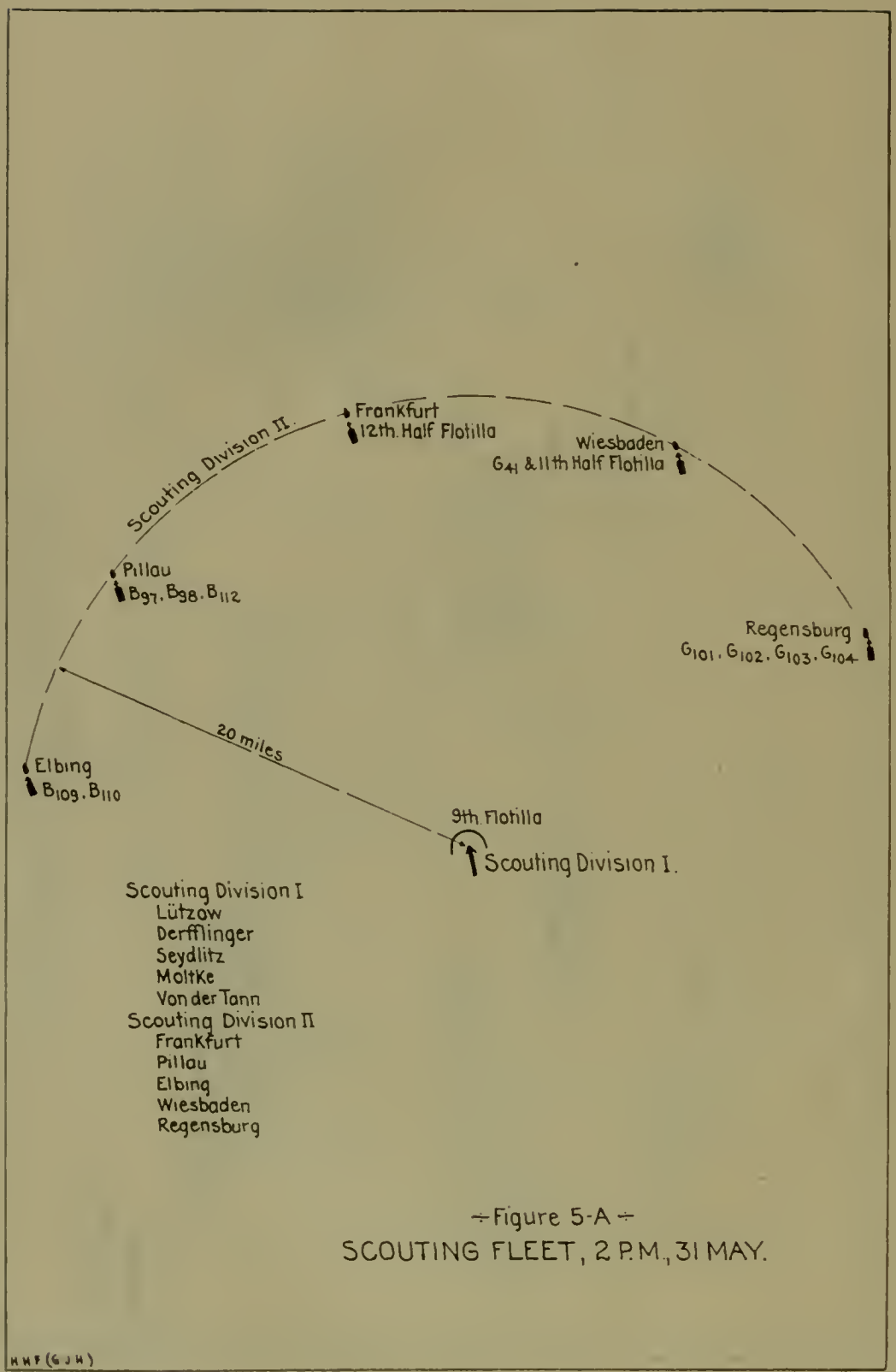


— Figure 4-A —
BATTLE FLEET, 2 P.M., 31 MAY



— Figure 5. —

BATTLE CRUISER FLEET AT 2 P.M. 31 MAY.



÷Figure 5-A÷
SCOUTING FLEET, 2 P.M., 31 MAY.

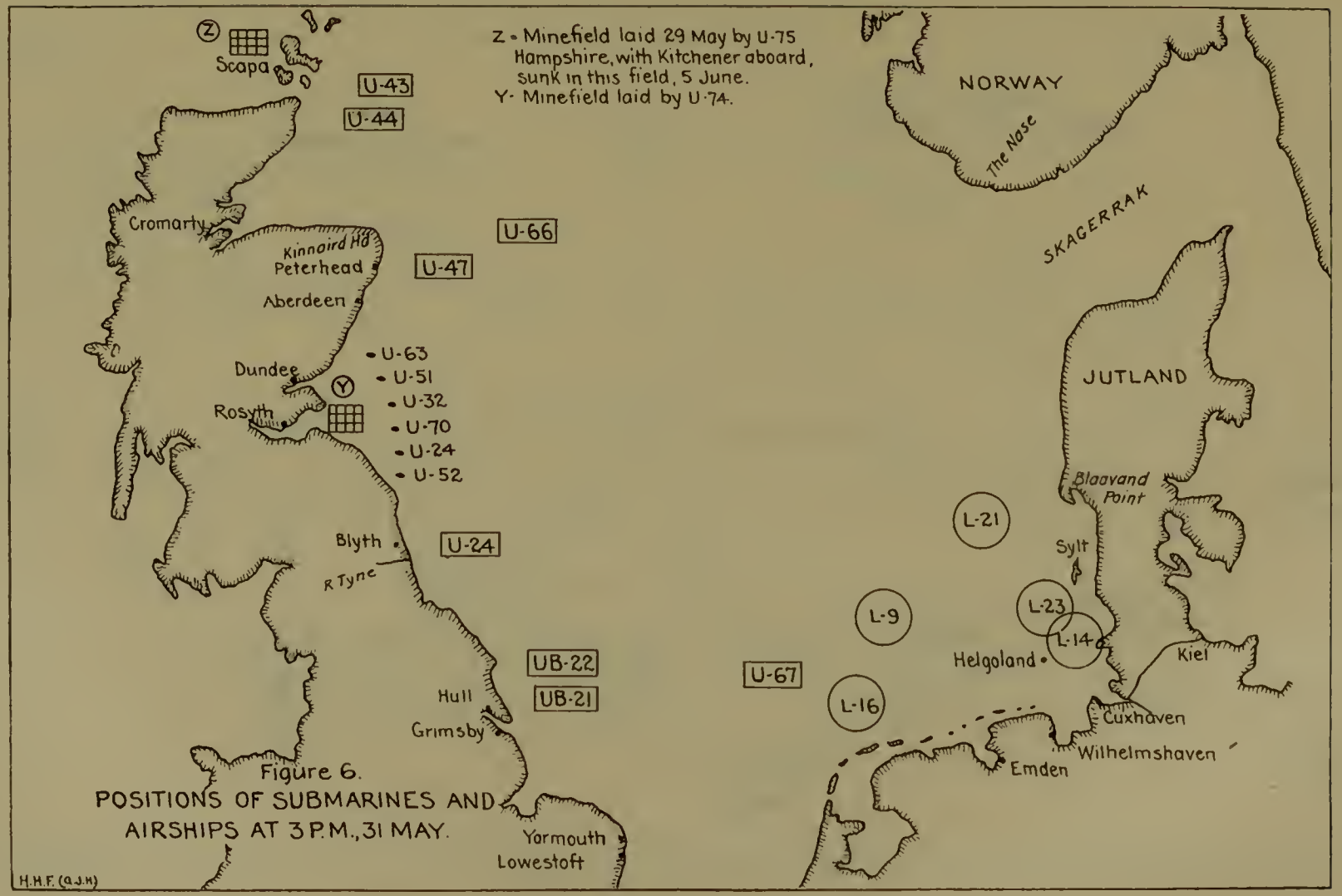
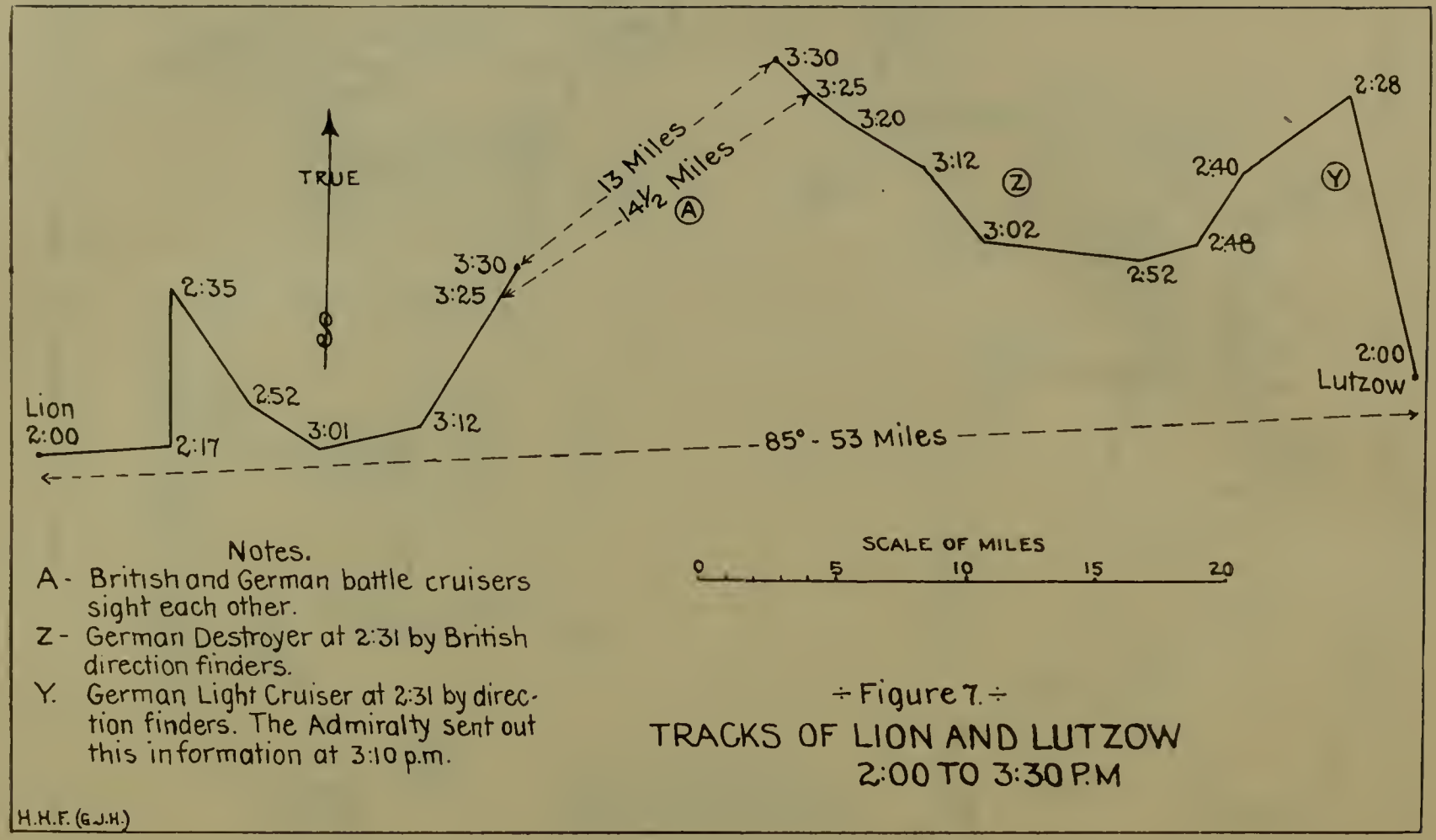


Figure 6.
POSITIONS OF SUBMARINES AND AIRSHIPS AT 3 P.M., 31 MAY.



Notes.

A - British and German battle cruisers sight each other.

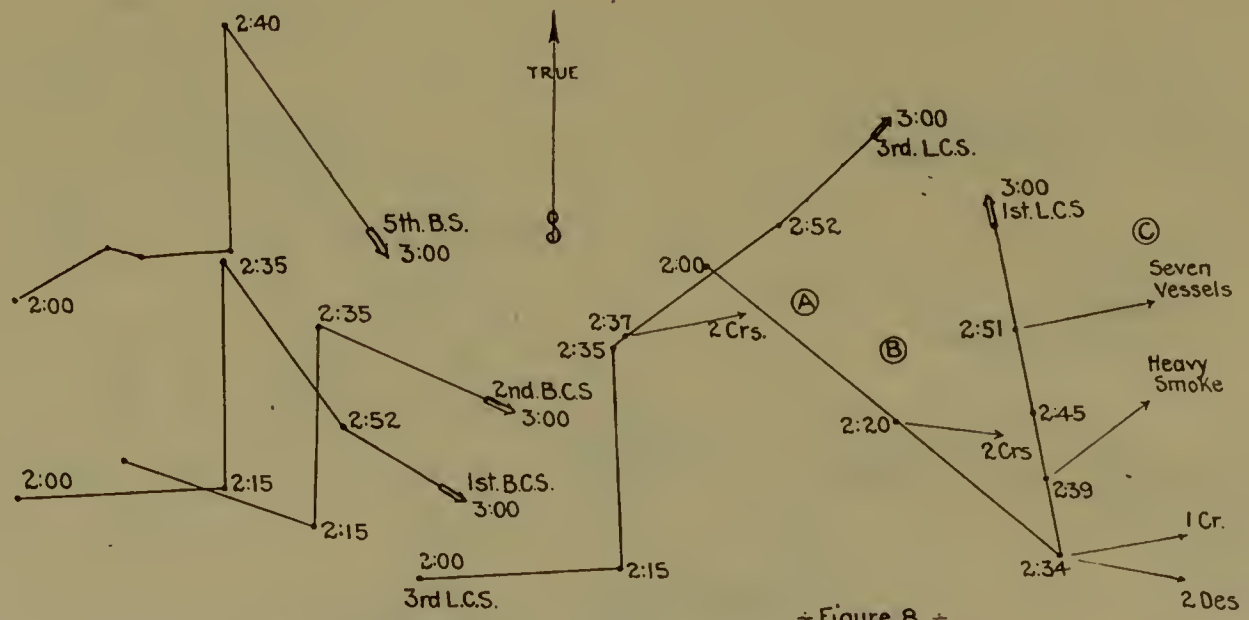
Z - German Destroyer at 2:31 by British direction finders.

Y. German Light Cruiser at 2:31 by direction finders. The Admiralty sent out this information at 3:10 p.m.

H.H.F. (G.J.H.)

÷ Figure 7. ÷

TRACKS OF LION AND LUTZOW
2:00 TO 3:30 P.M



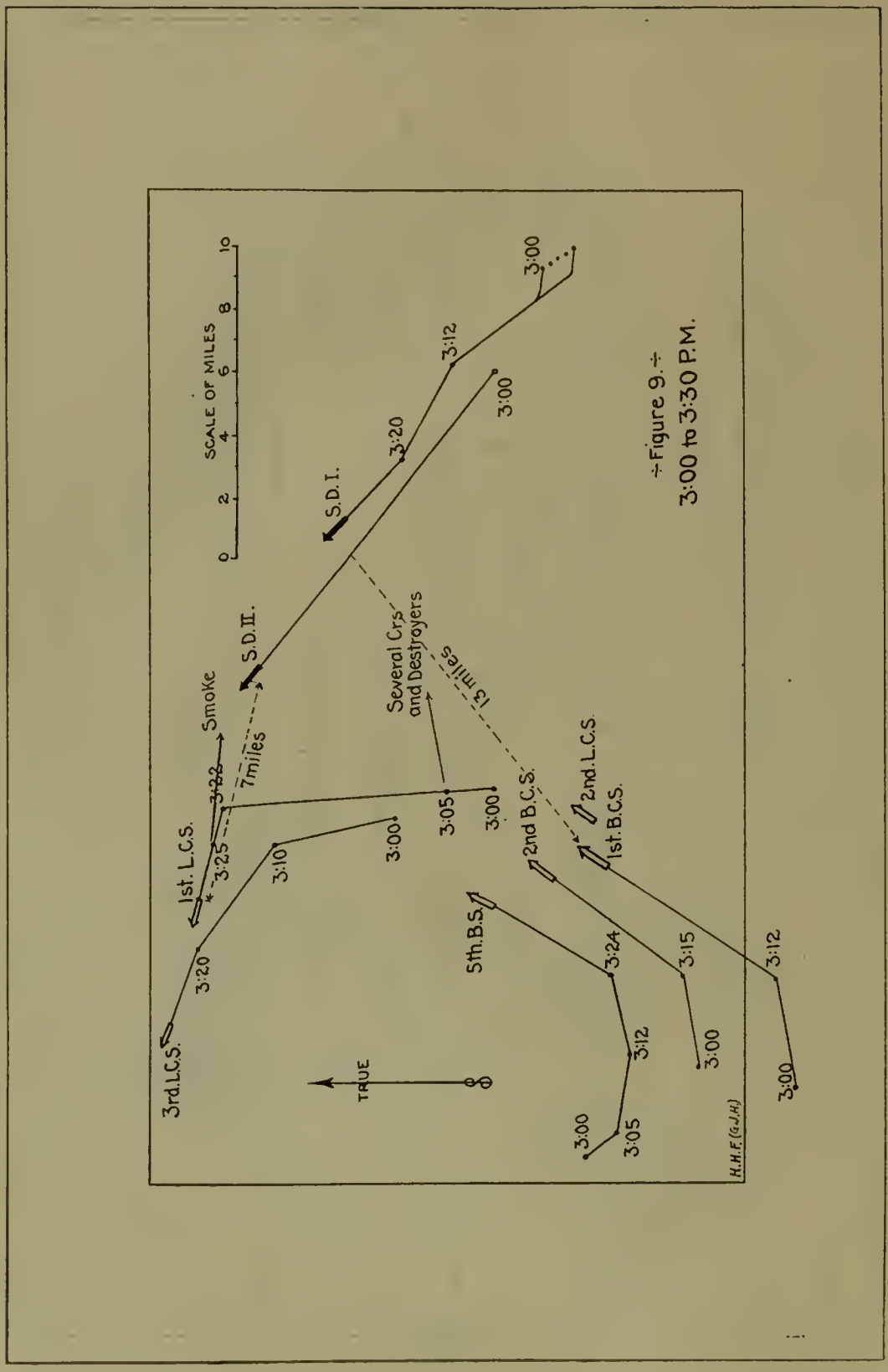
Note: 2nd. L.C.S. is omitted from this sketch.
Arrows show bearings of German
Forces as reported.
Reported positions of Galatea –
A - 2:34; B - 2:39; C - 2:51.

÷ Figure 8. ÷

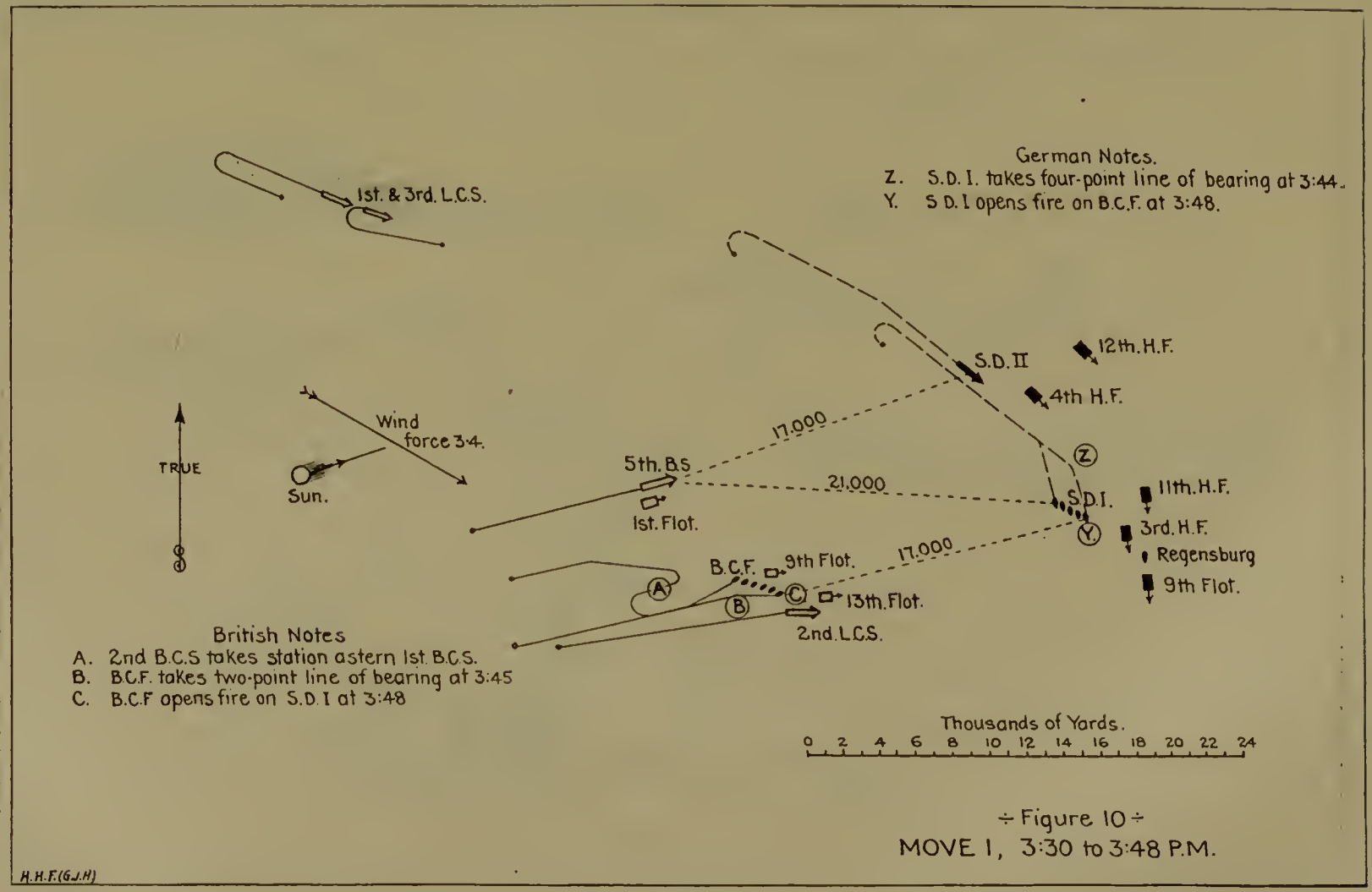
DEPLOYMENT OF THE BATTLE CRUISER
FLEET 2:00 TO 3:00 P.M.

SCALE OF MILES.
0 2 4 6 8 10

H.H.F (G.J.H)

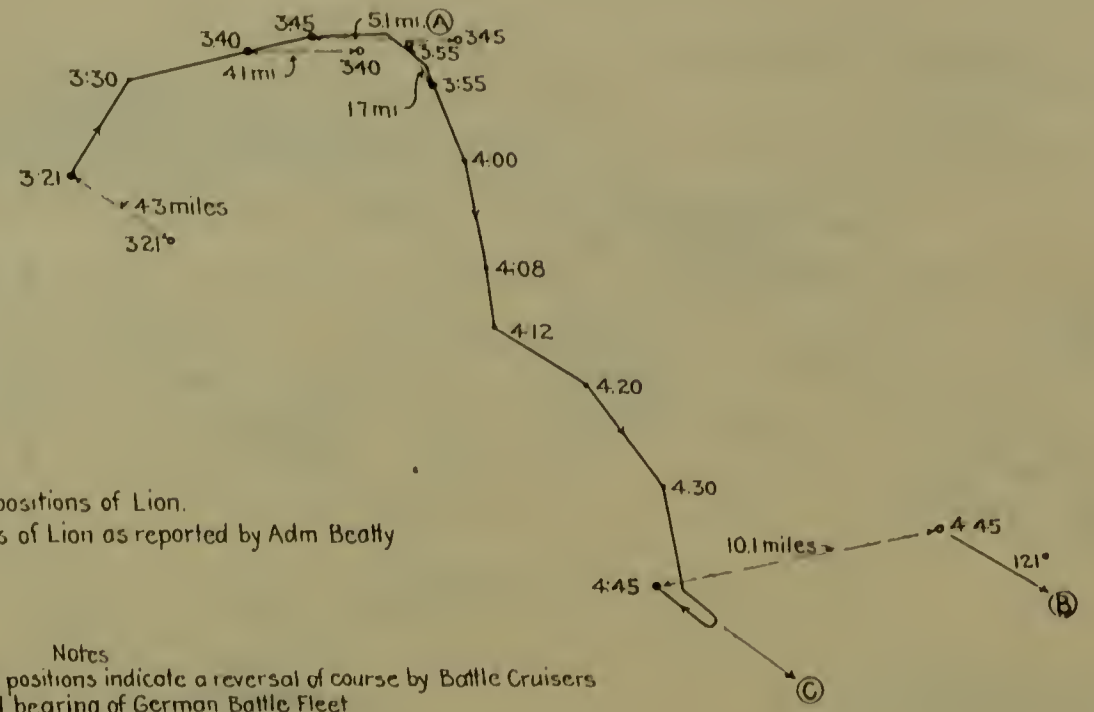


÷Figure 9.÷
3:00 to 3:30 P.M.



÷ Figure 10 ÷

MOVE 1, 3:30 to 3:48 P.M.



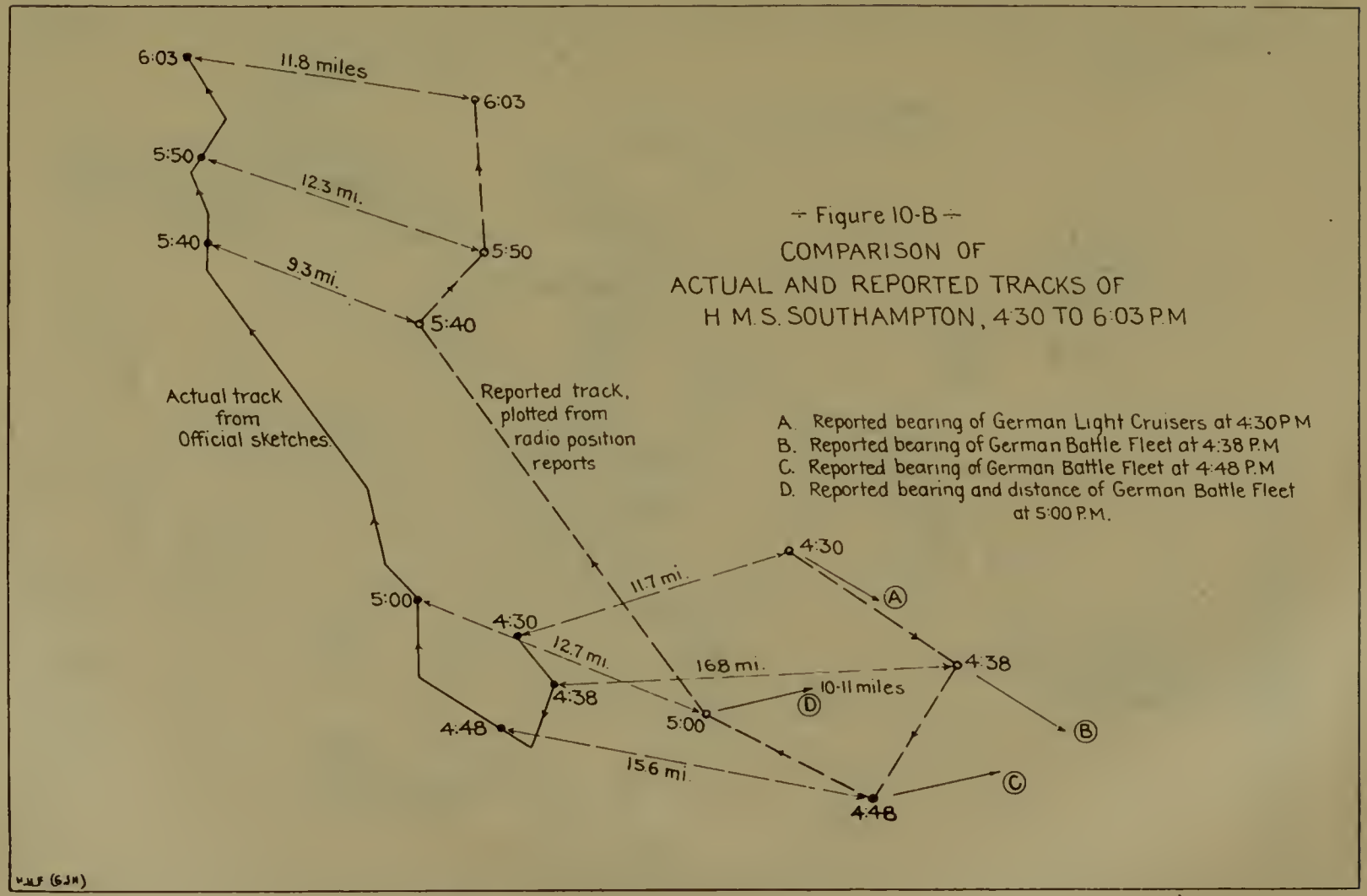
Notes

A Reported positions indicate a reversal of course by Battle Cruisers
B. Reported bearing of German Battle Fleet
C Actual bearing of leading ship.

Figure 10-A

TRACK OF LION FROM 3:21 TO 4:45 P.M.

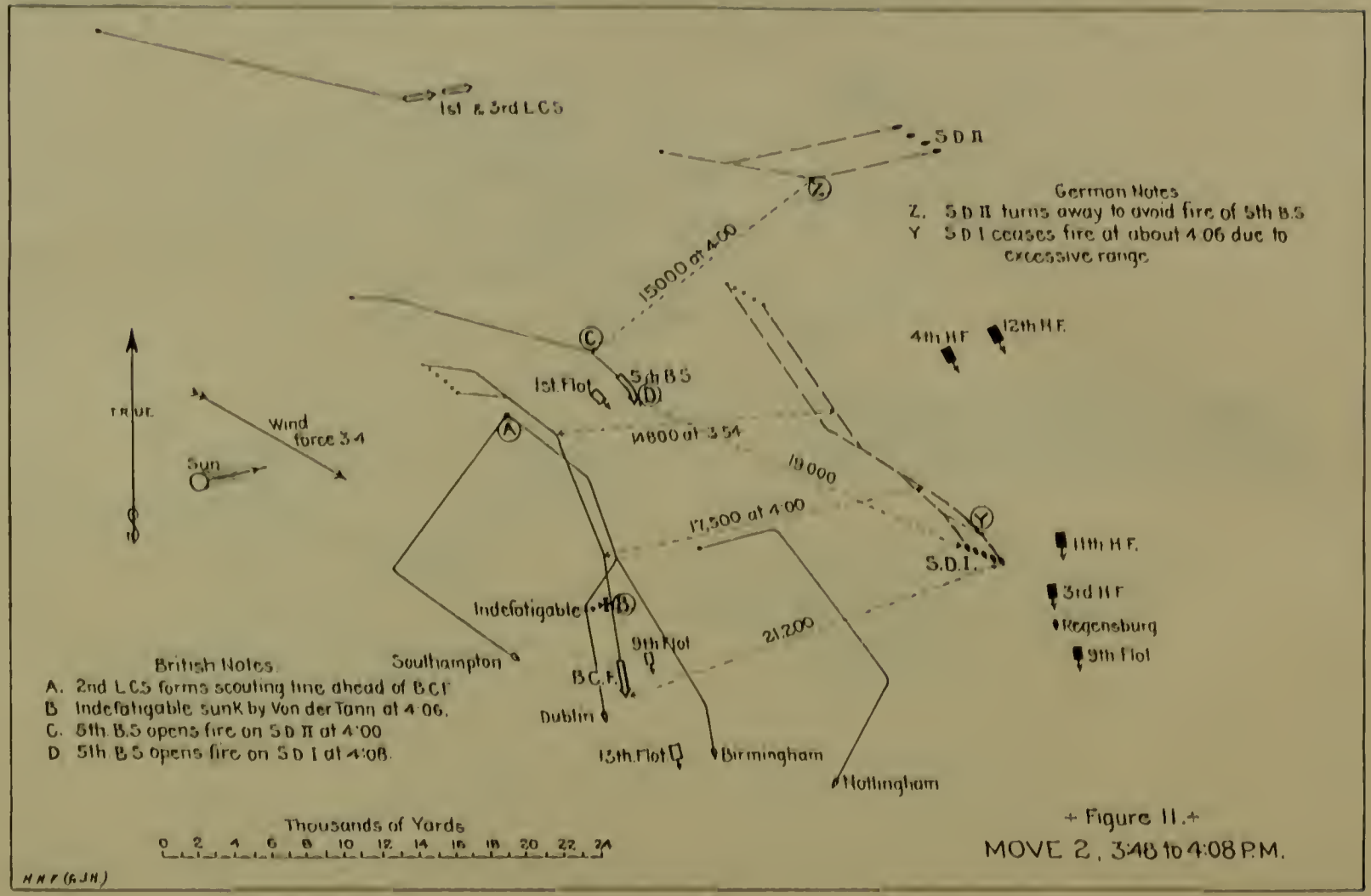
H.M.F. (G.J.H.)



÷ Figure 10-B ÷

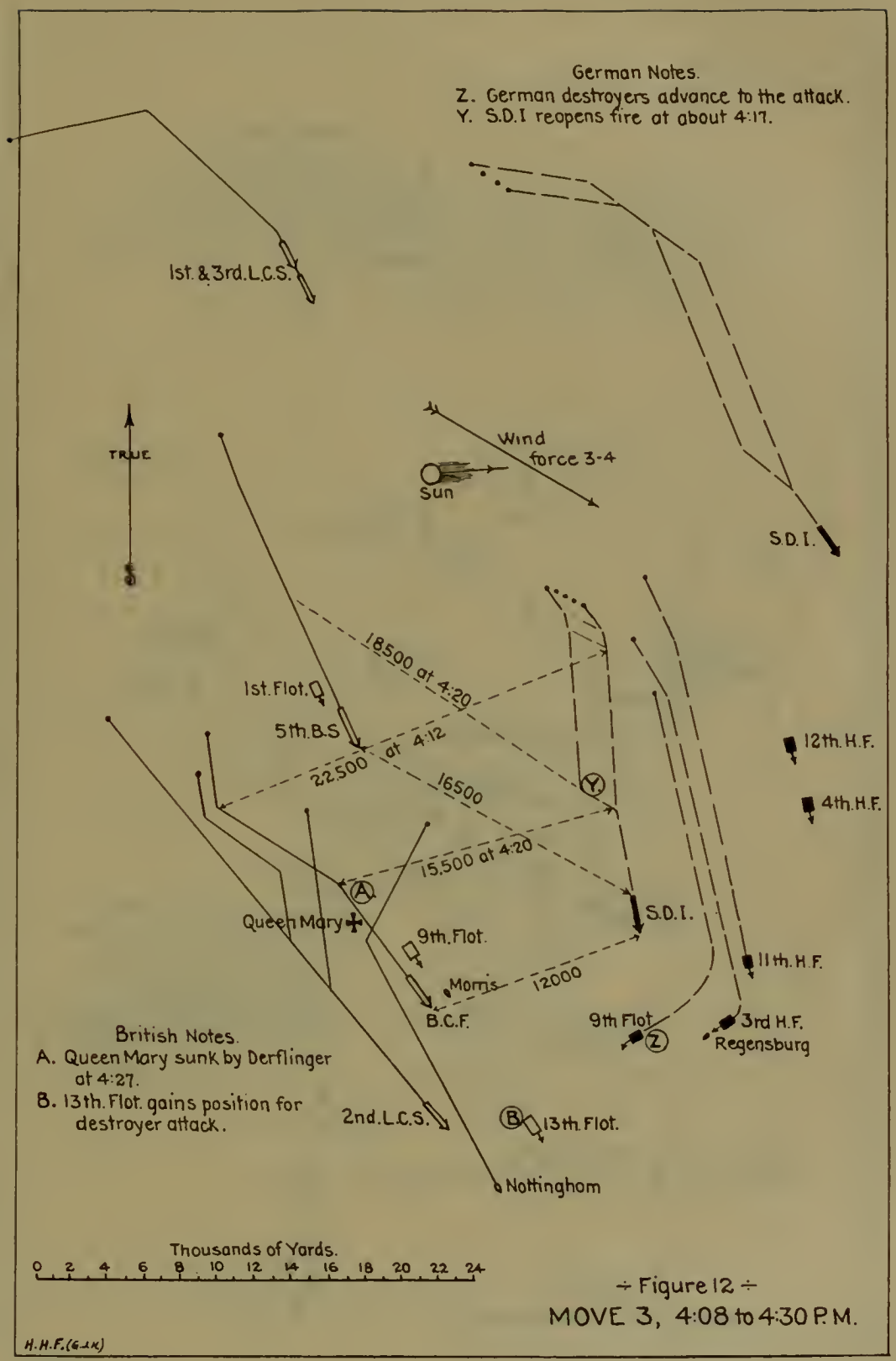
COMPARISON OF
ACTUAL AND REPORTED TRACKS OF
H.M.S. SOUTHAMPTON, 4:30 TO 6:03 P.M

WWF (GJH)



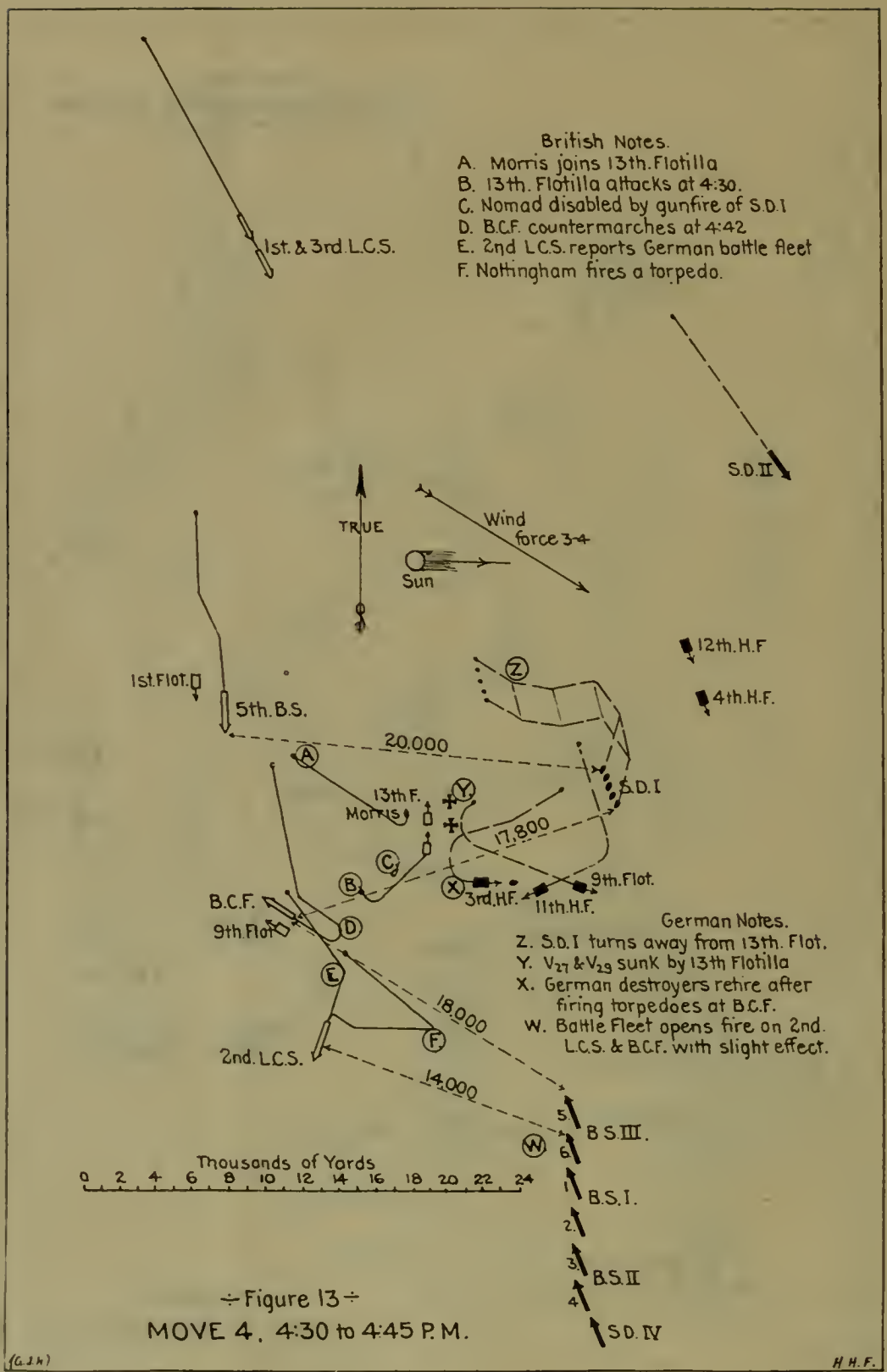
+ Figure 11.+

MOVE 2, 3.48 to 4.08 P.M.



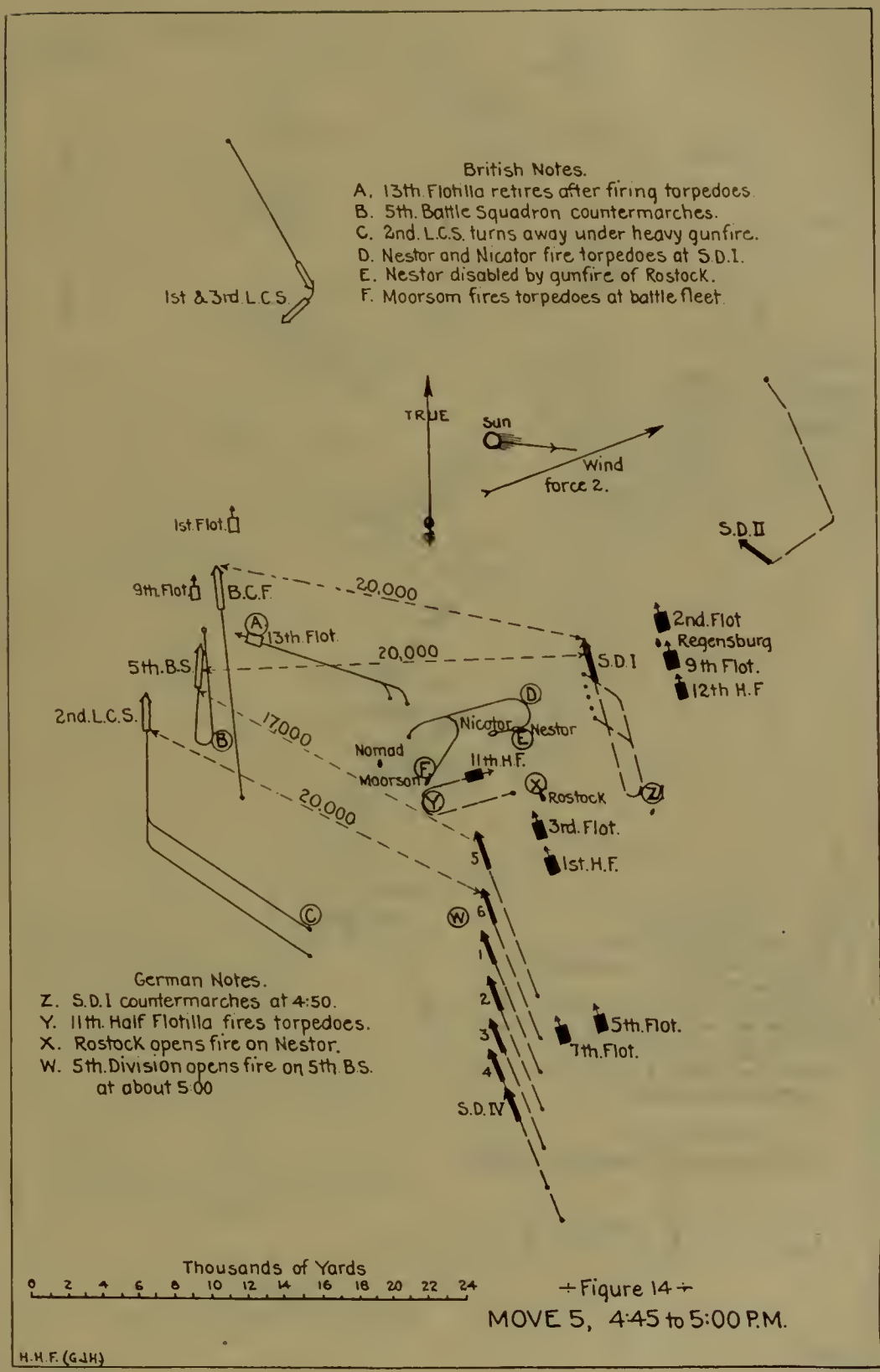
÷ Figure 12 ÷

MOVE 3, 4:08 to 4:30 P.M.



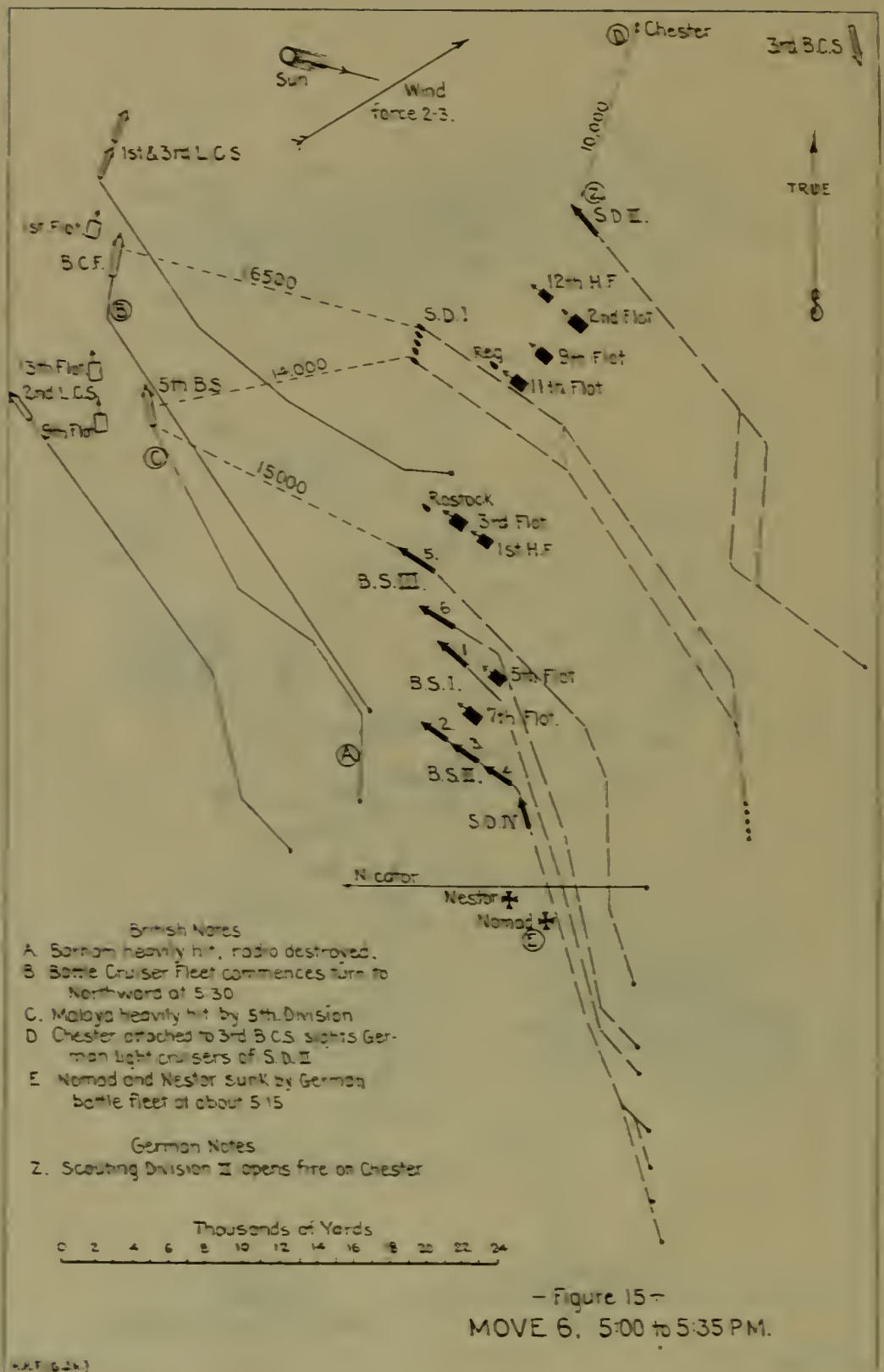
÷Figure 13÷

MOVE 4. 4:30 to 4:45 P.M.



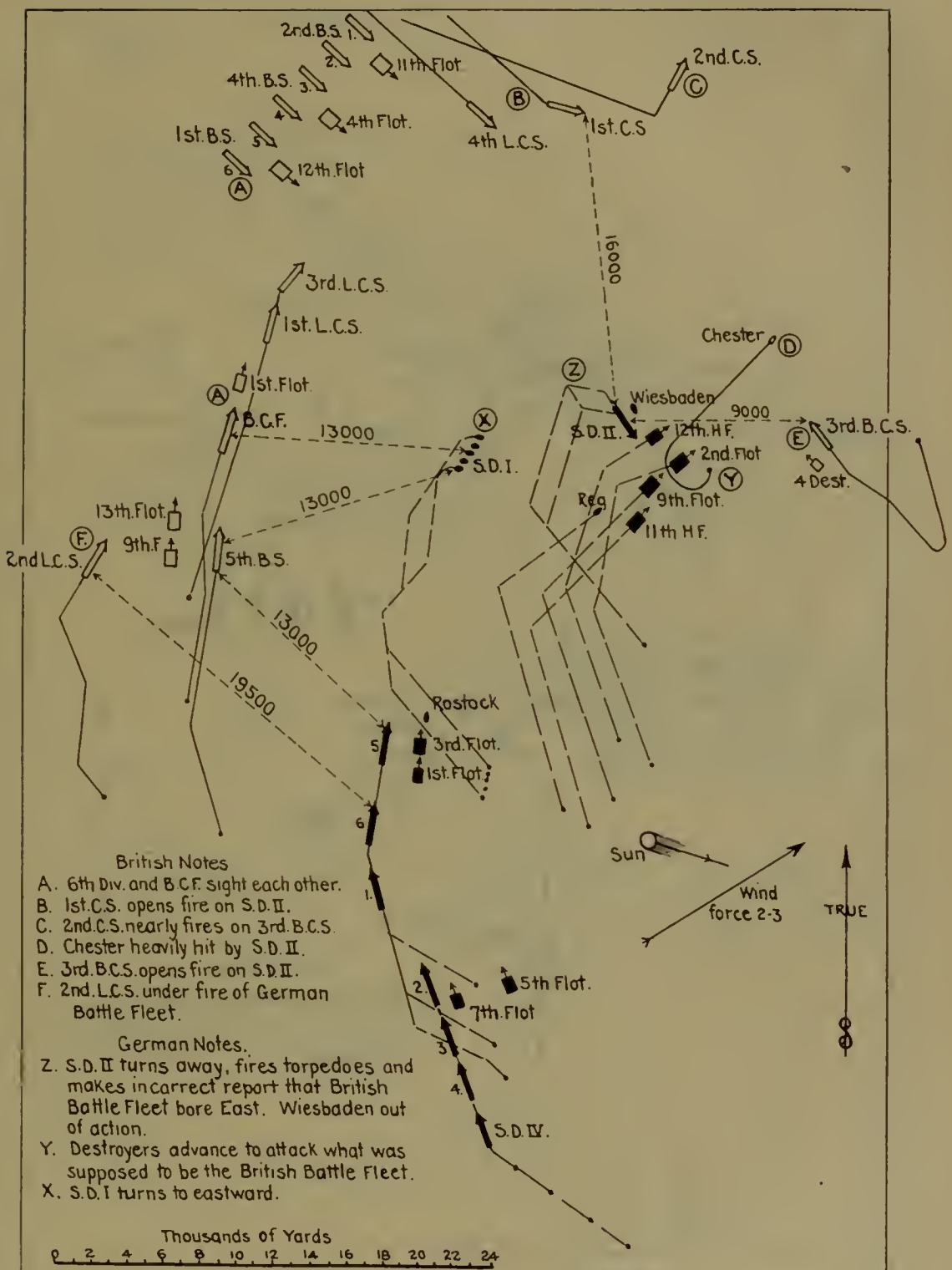
÷Figure 14÷

MOVE 5, 4:45 to 5:00 P.M.



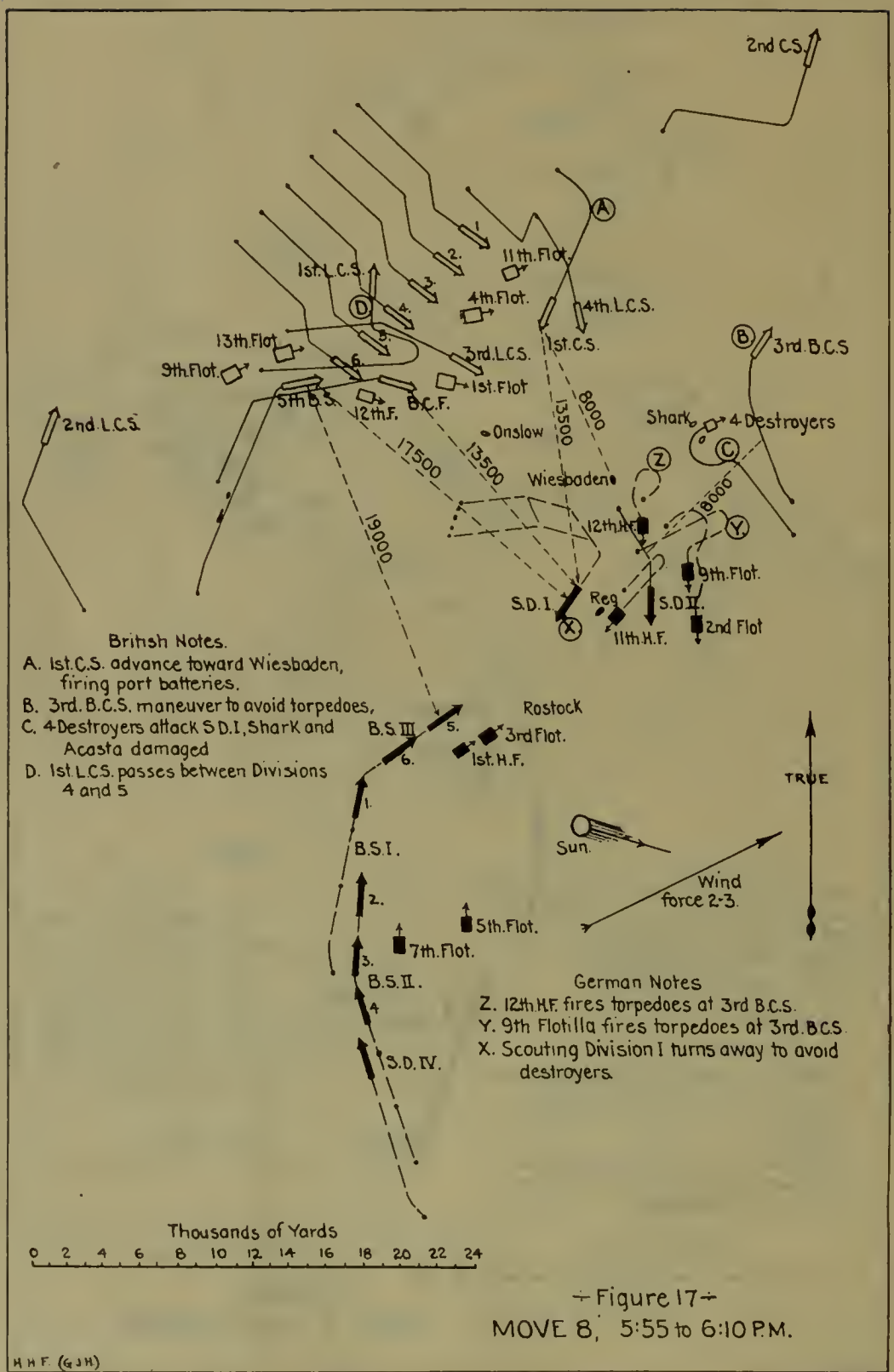
– Figure 15 –

MOVE 6. 5:00 to 5:35 P.M.



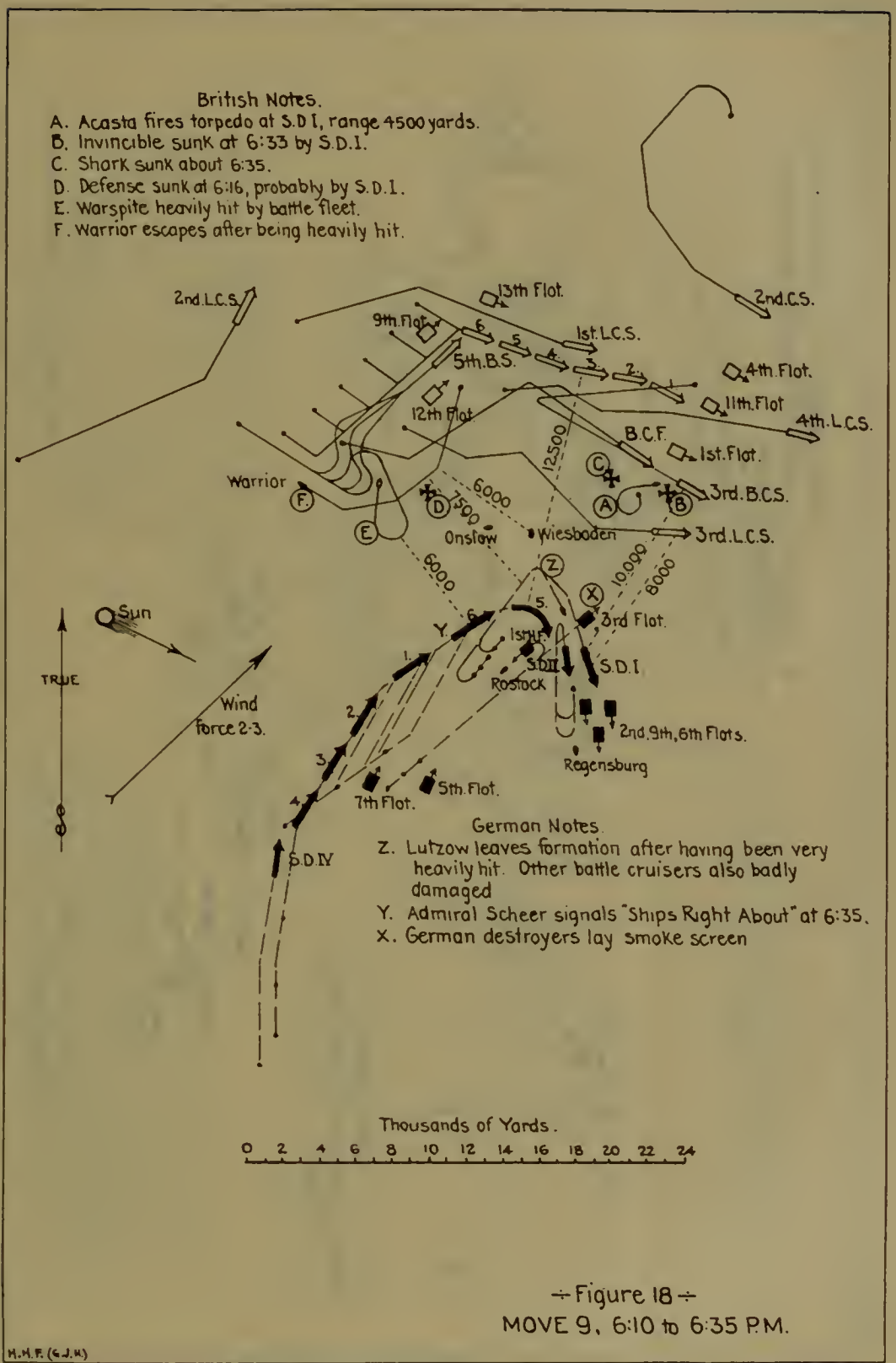
÷ Figure 16. ÷

MOVE 7, 5:35 to 5:55 P.M.

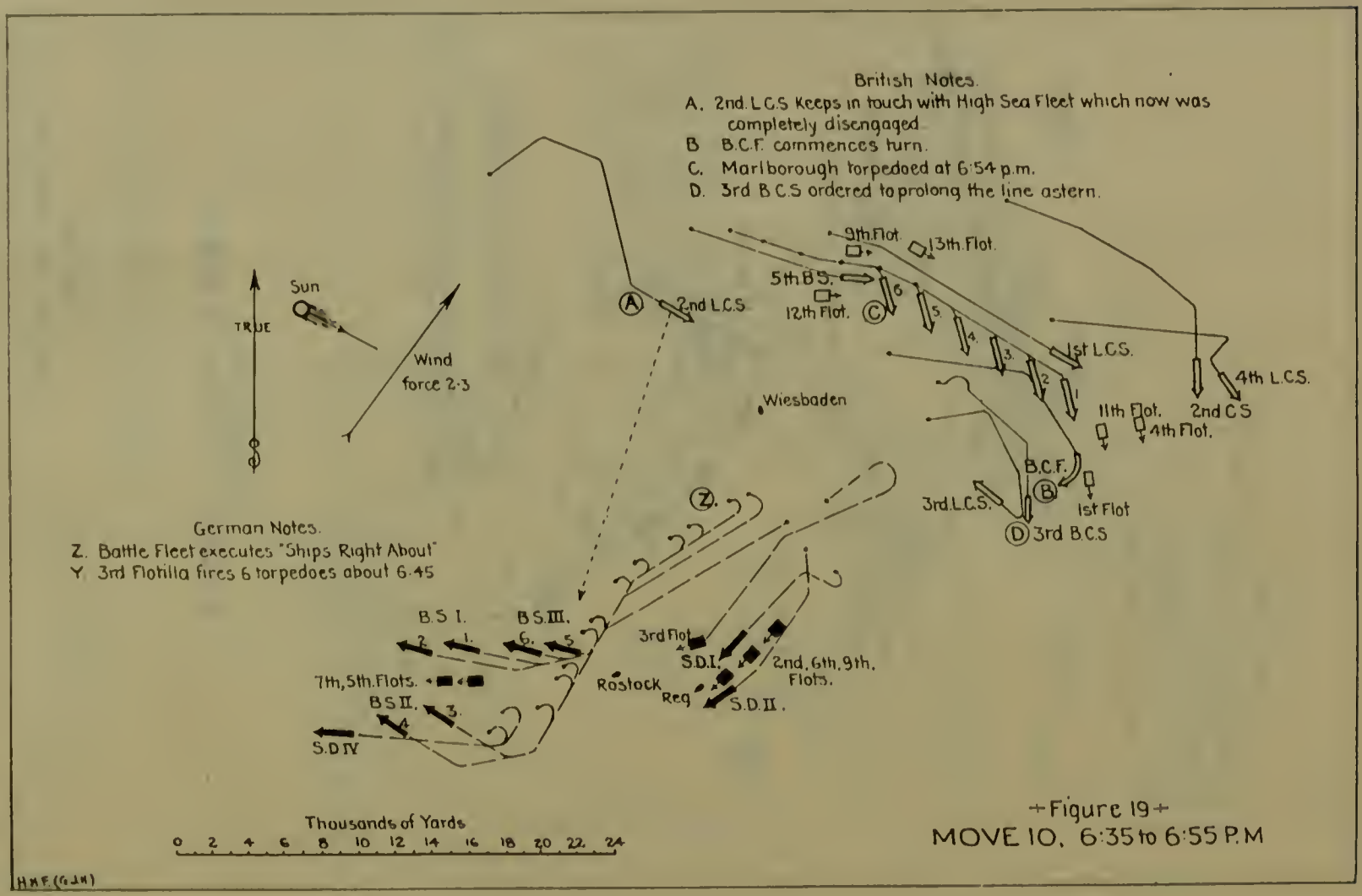


÷Figure 17÷

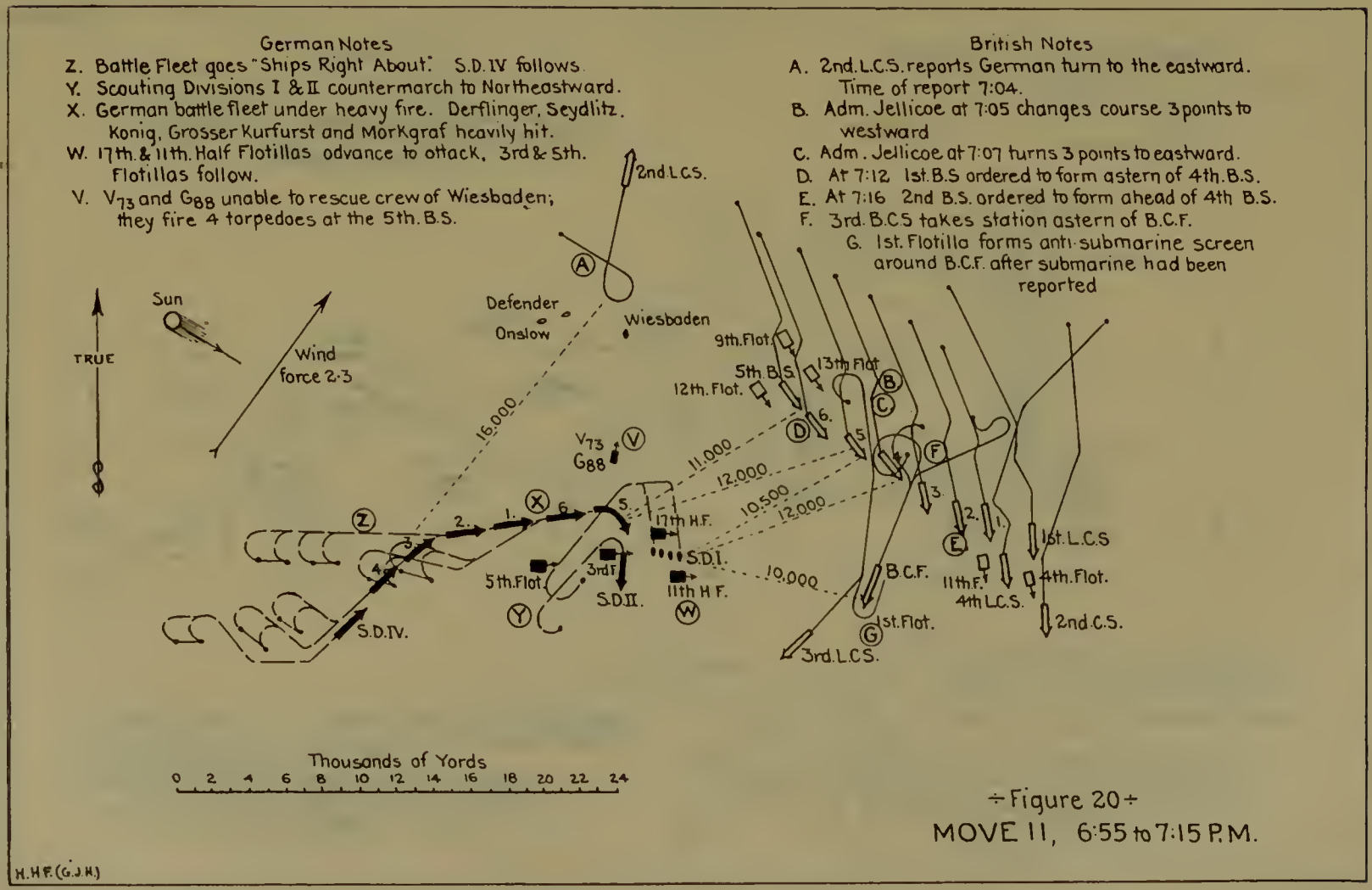
MOVE 8, 5:55 to 6:10 P.M.



÷ Figure 18 ÷
MOVE 9, 6:10 to 6:35 P.M.

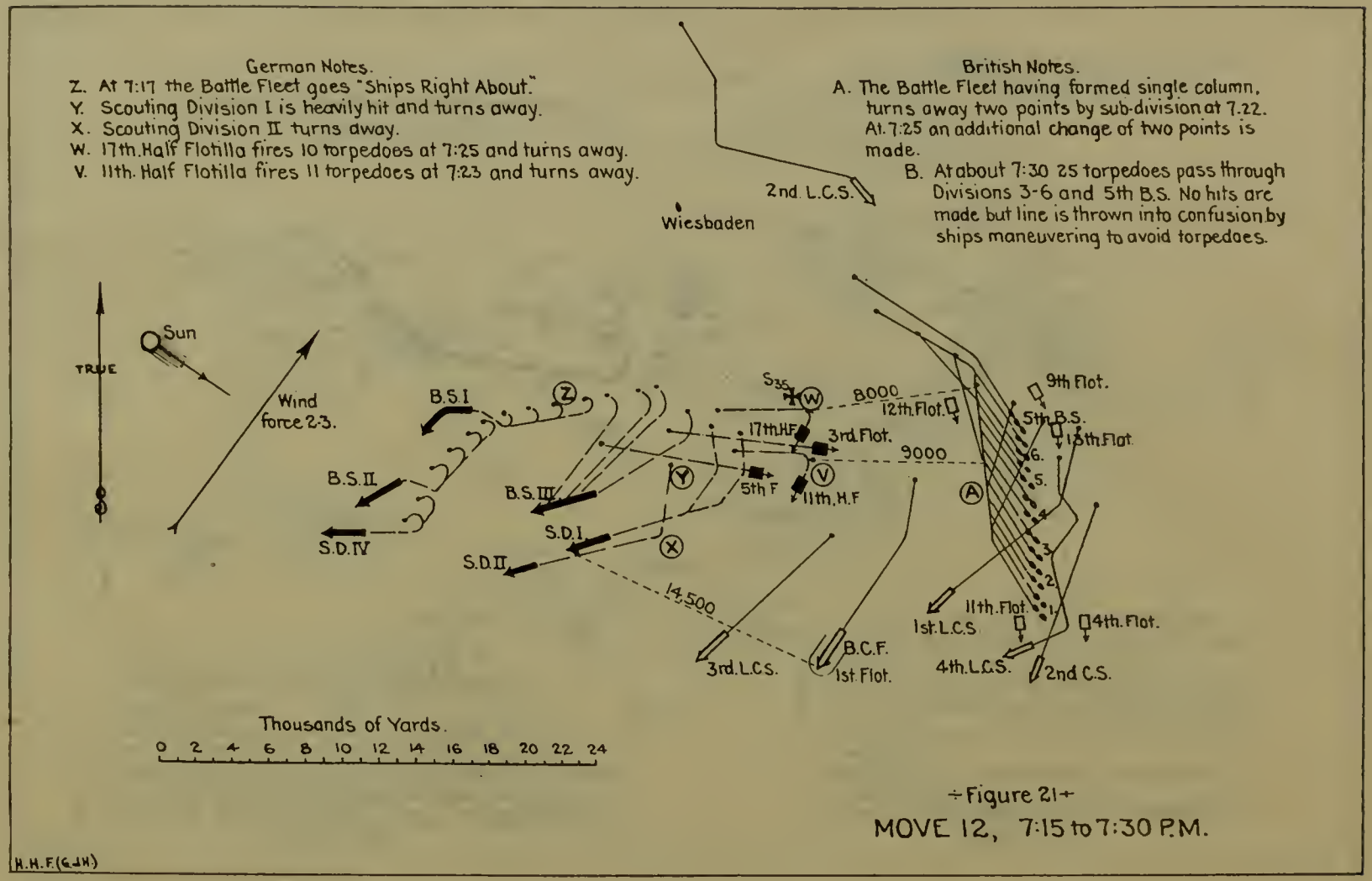


+Figure 19+
MOVE 10, 6:35 to 6:55 P.M


German Notes
Z. Battle Fleet goes "Ships Right About." S.D.IV follows.
Y. Scouting Divisions I & II countermarch to Northeastward.
X. German battle fleet under heavy fire. Derflinger, Seydlitz, Konig, Grosser Kurfurst and Morkgraf heavily hit.
W. 17th. & 11th. Half Flotillas advance to attack, 3rd & 5th. Flotillas follow.
V. V73 and G88 unable to rescue crew of Wiesbaden; they fire 4 torpedoes at the 5th. B.S.
British Notes
A. 2nd. L.C.S. reports German turn to the eastward. Time of report 7:04.
B. Adm. Jellicoe at 7:05 changes course 3 points to westward
C. Adm. Jellicoe at 7:07 turns 3 points to eastward.
D. At 7:12 1st. B.S ordered to form astern of 4th. B.S.
E. At 7:16 2nd B.S. ordered to form ahead of 4th B.S.
F. 3rd. B.C.S takes station astern of B.C.F.
G. 1st. Flotilla forms anti-submarine screen around B.C.F. after submarine had been reported
TRUE
Sun
Wind force 2-3
Defender
Onslow
Wiesbaden
2nd.L.C.S.
9th.Flot.
5th.B.S.
13th.Flot.
12th.Flot.
16,000
11,000
12,000
10,500
12,000
10,000
V73
G88
17th H.F.
S.D.I.
3rdF.
5th.Flot.
S.D.II.
11th H.F.
S.D.IV.
B.C.F.
11th.F.
4th L.C.S.
4th.Flot.
1st.L.C.S
2nd.C.S.
1st.Flot.
3rd.L.C.S.
Thousands of Yards
0 2 4 6 8 10 12 14 16 18 20 22 24
H.H.F.(G.J.H.)

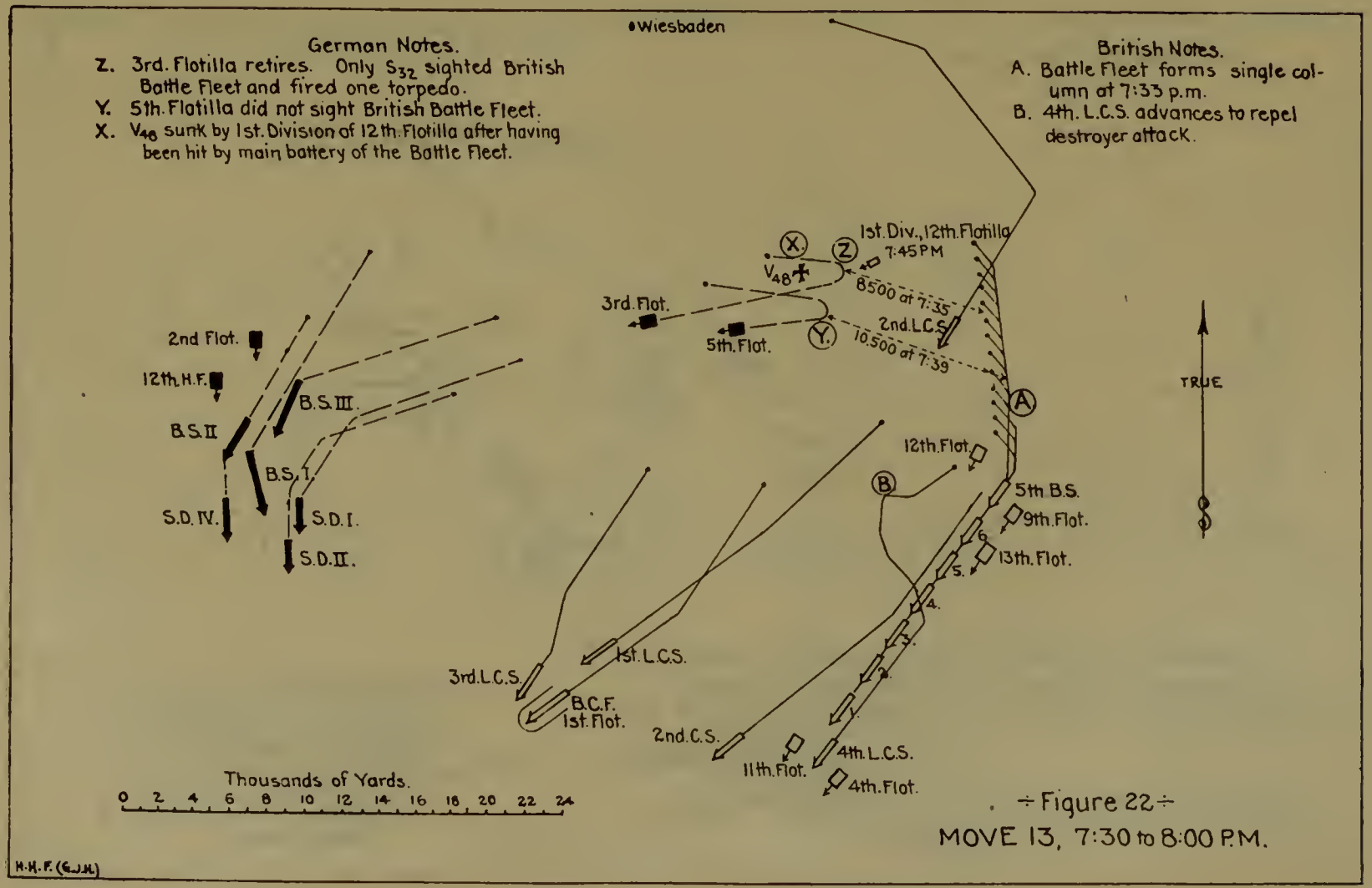
÷Figure 20÷

MOVE 11, 6:55 to 7:15 P.M.



÷Figure 21÷

MOVE 12, 7:15 to 7:30 P.M.



÷ Figure 22 ÷

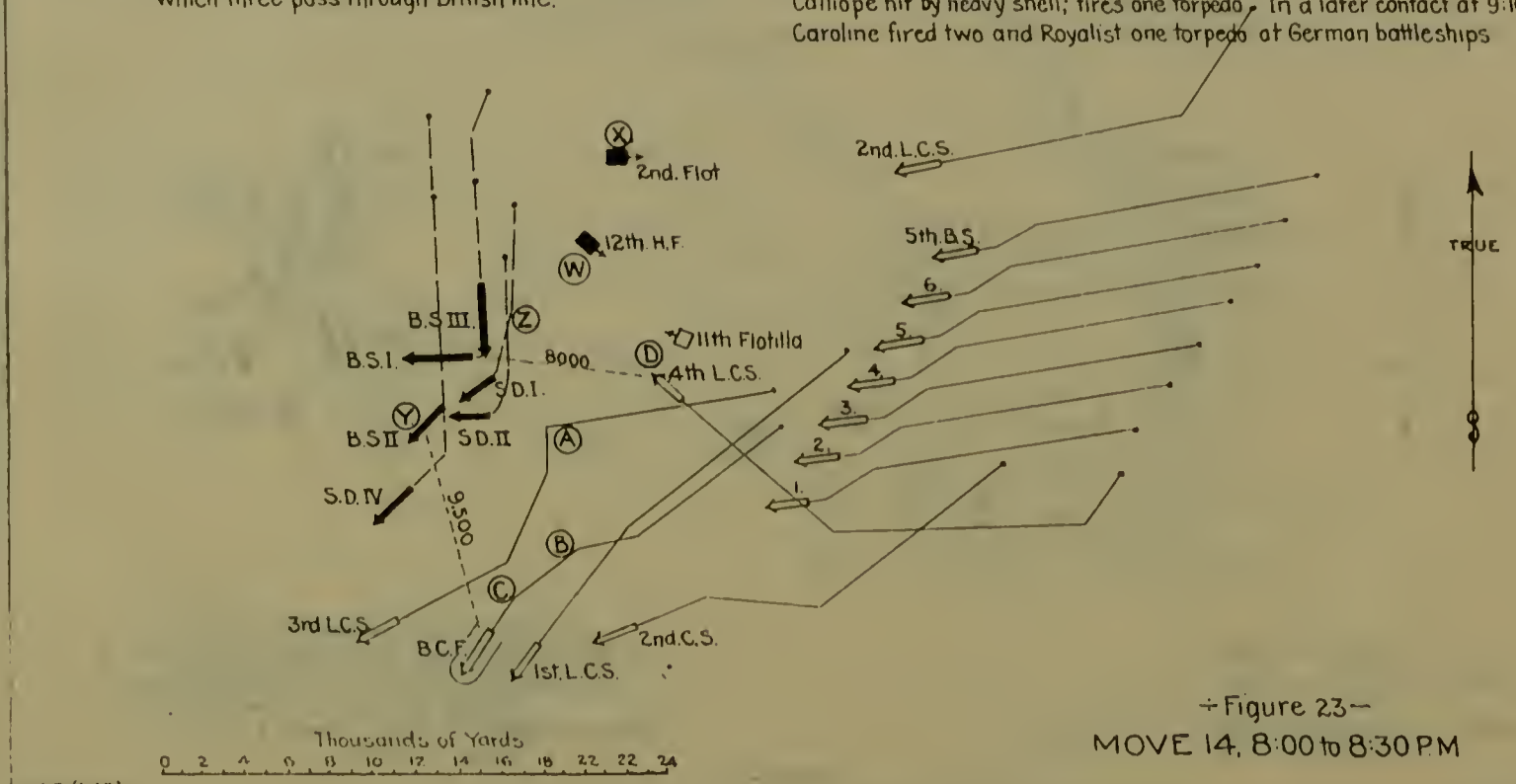
MOVE 13, 7:30 to 8:00 P.M.

German Notes

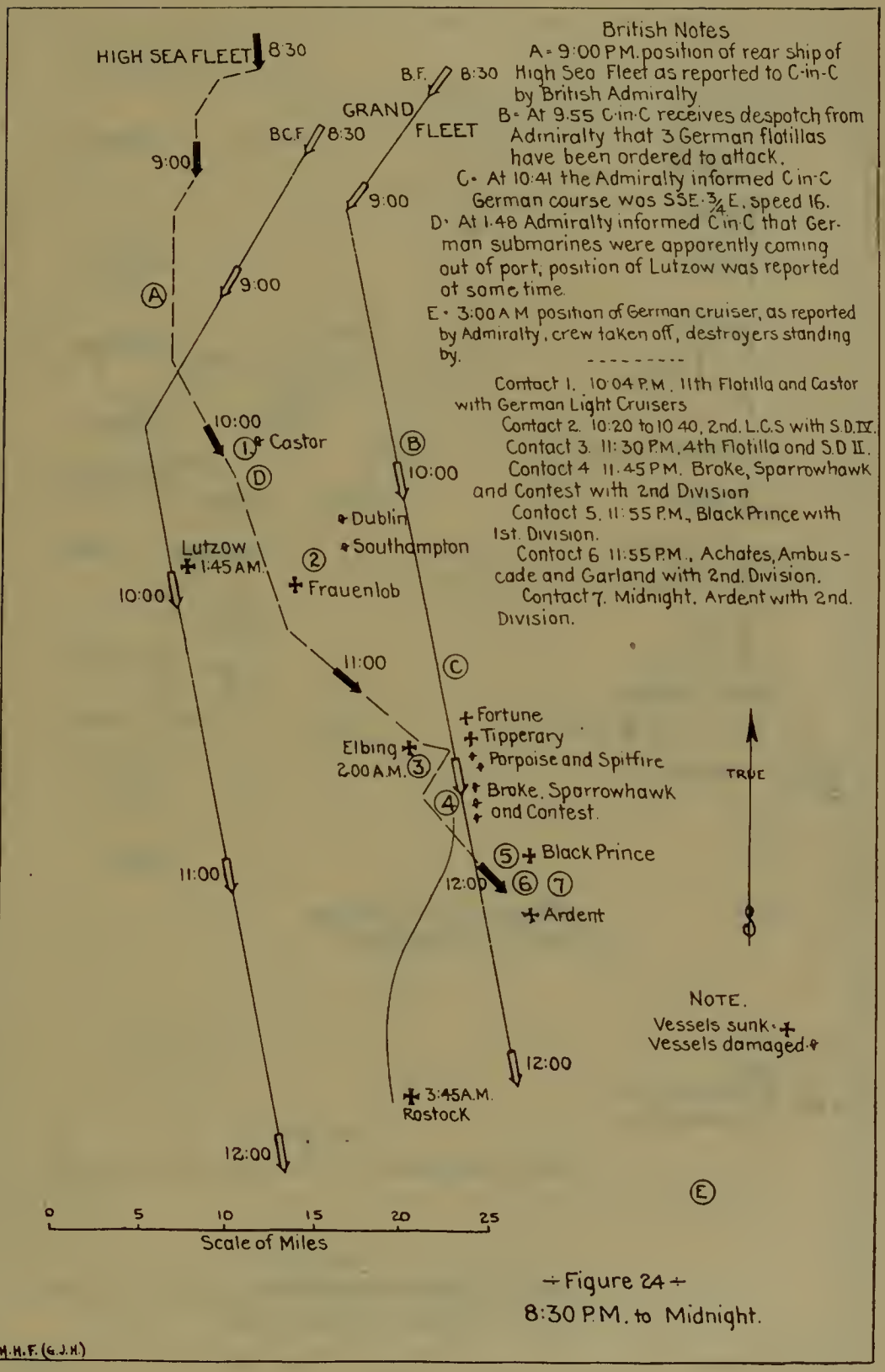
Z. Scouting Division I engages B.C.F.
Y Battle Squadron II engages B.C.F.
X. 2nd. Flotilla returns via Skaggerak after making this attack; one boat hit by 2nd L.C.S at 8.30 and another at 9 00.
W 12th Half Flotilla fires torpedoes, of which three pass through British line.

British Notes

A 3rd L.C.S sights High Sea Fleet at about 8:18. At 8:00 this squadron had searched to Westward in scouting line in accordance with instructions of S.O., B.C.F.; 3rd L.C.S engages S.D IV.
B B.C.F engages S.D I.
C B.C.F engages B.S.II.
D 4th L.C.S makes contact with German battleships; drives off 12th. Half Flot Calliope hit by heavy shell; fires one torpedo. In a later contact at 9:10 Caroline fired two and Royalist one torpedo at German battleships

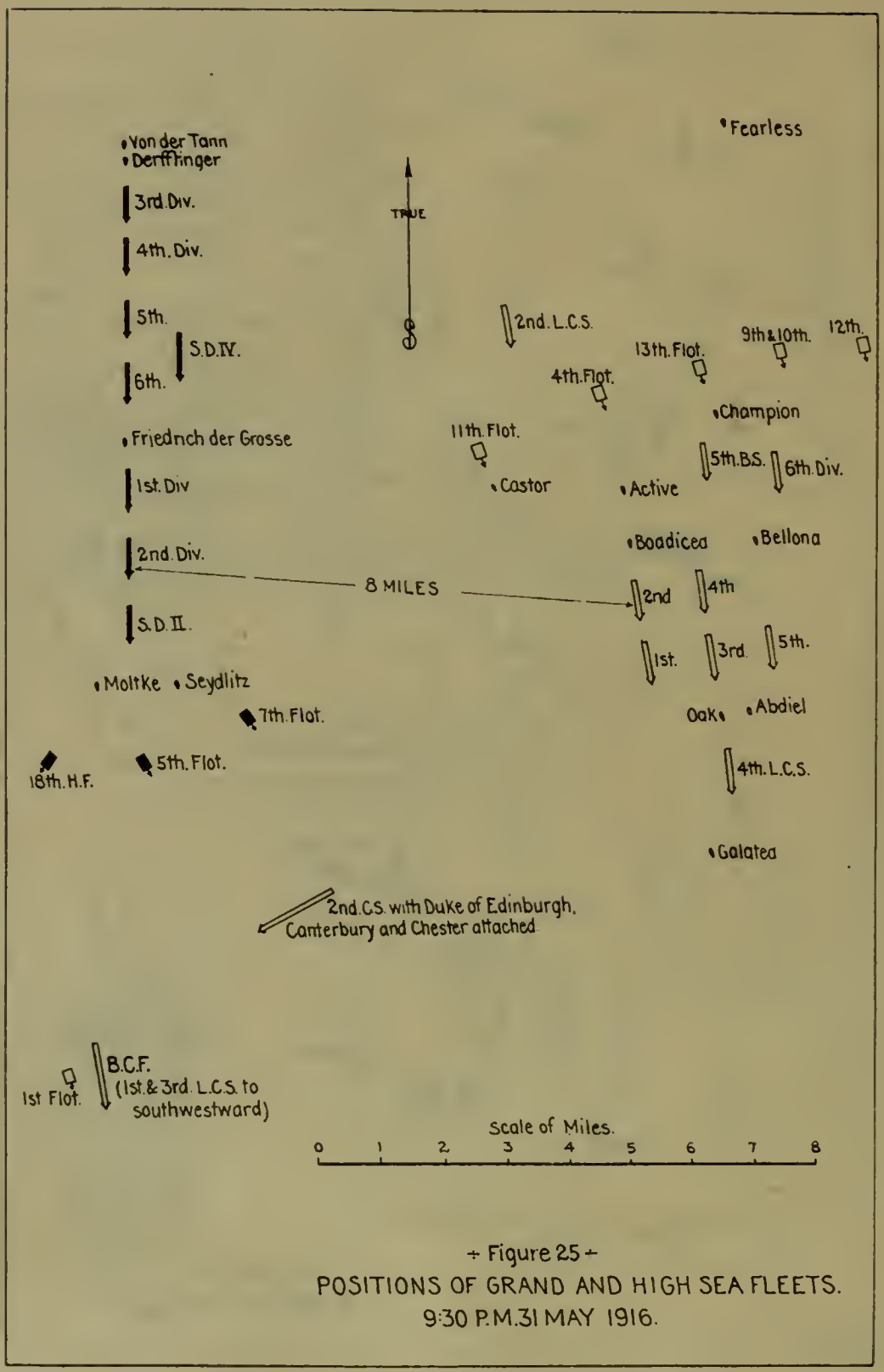


÷Figure 23—
MOVE 14, 8:00 to 8:30 P.M.


British Notes
A- 9:00 P.M. position of rear ship of High Sea Fleet as reported to C-in-C by British Admiralty
B- At 9.55 C-in-C receives despotch from Admiralty that 3 German flotillas have been ordered to attack.
C- At 10:41 the Admiralty informed C in-C German course wos SSE-¾E. speed 16.
D- At 1.48 Admiralty informed C in-C that German submarines were apporently coming out of port, position of Lutzow was reported at some time.
E- 3:00 A M position of German cruiser, as reported by Admiralty, crew taken off, destroyers standing by.
Contact 1. 10:04 P.M. 11th Flotilla and Castor with German Light Cruisers
Contact 2. 10:20 to 10 40, 2nd. L.C.S with S.D.IV.
Contact 3. 11:30 P.M. 4th Flotilla and S.D II.
Contact 4 11.45 P.M. Broke, Sparrowhawk and Contest with 2nd Division
Contact 5. 11:55 P.M., Black Prince with 1st. Division.
Contact 6 11:55 P.M., Achates, Ambuscade and Garland with 2nd. Division.
Contact 7. Midnight. Ardent with 2nd. Division.
HIGH SEA FLEET 8:30
B.F. 8:30
GRAND FLEET
B.C.F. 8:30
9:00
9:00
9:00
10:00
Castor
10:00
Dublin
Southampton
Lutzow 1:45 A.M.
Frauenlob
10:00
11:00
Fortune
Tipperary
Elbing 2:00 A.M.
Porpoise and Spitfire
Broke, Sparrowhawk and Contest.
Black Prince
11:00
12:00
Ardent
12:00
3:45 A.M. Rostock
12:00
TRUE
NOTE.
Vessels sunk ✢
Vessels damaged ✢
0 5 10 15 20 25
Scale of Miles
H.H.F. (G.J.H.)

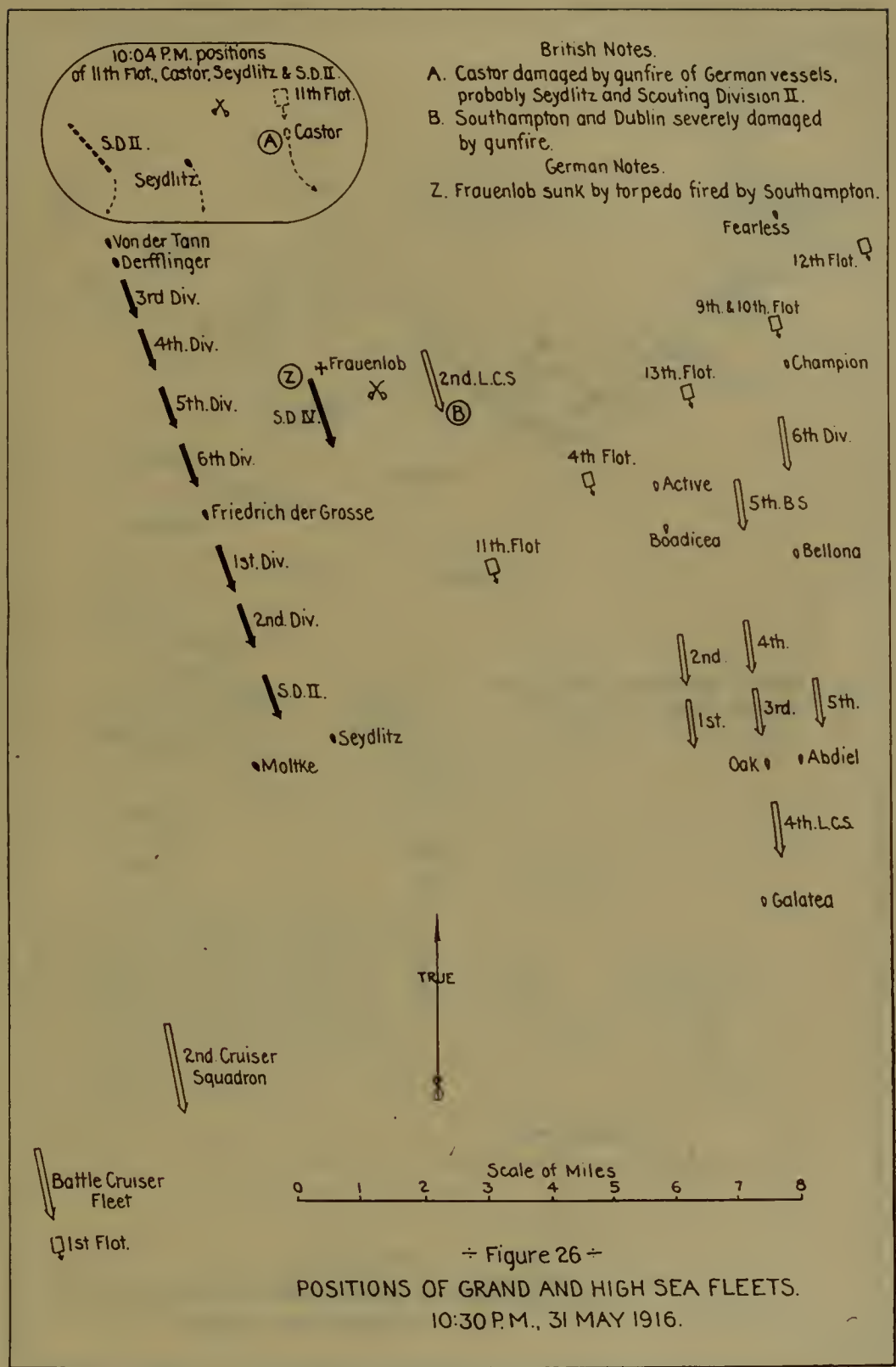
✢ Figure 24 ✢

8:30 P.M. to Midnight.



÷ Figure 25 ÷

POSITIONS OF GRAND AND HIGH SEA FLEETS.
9:30 P.M. 31 MAY 1916.

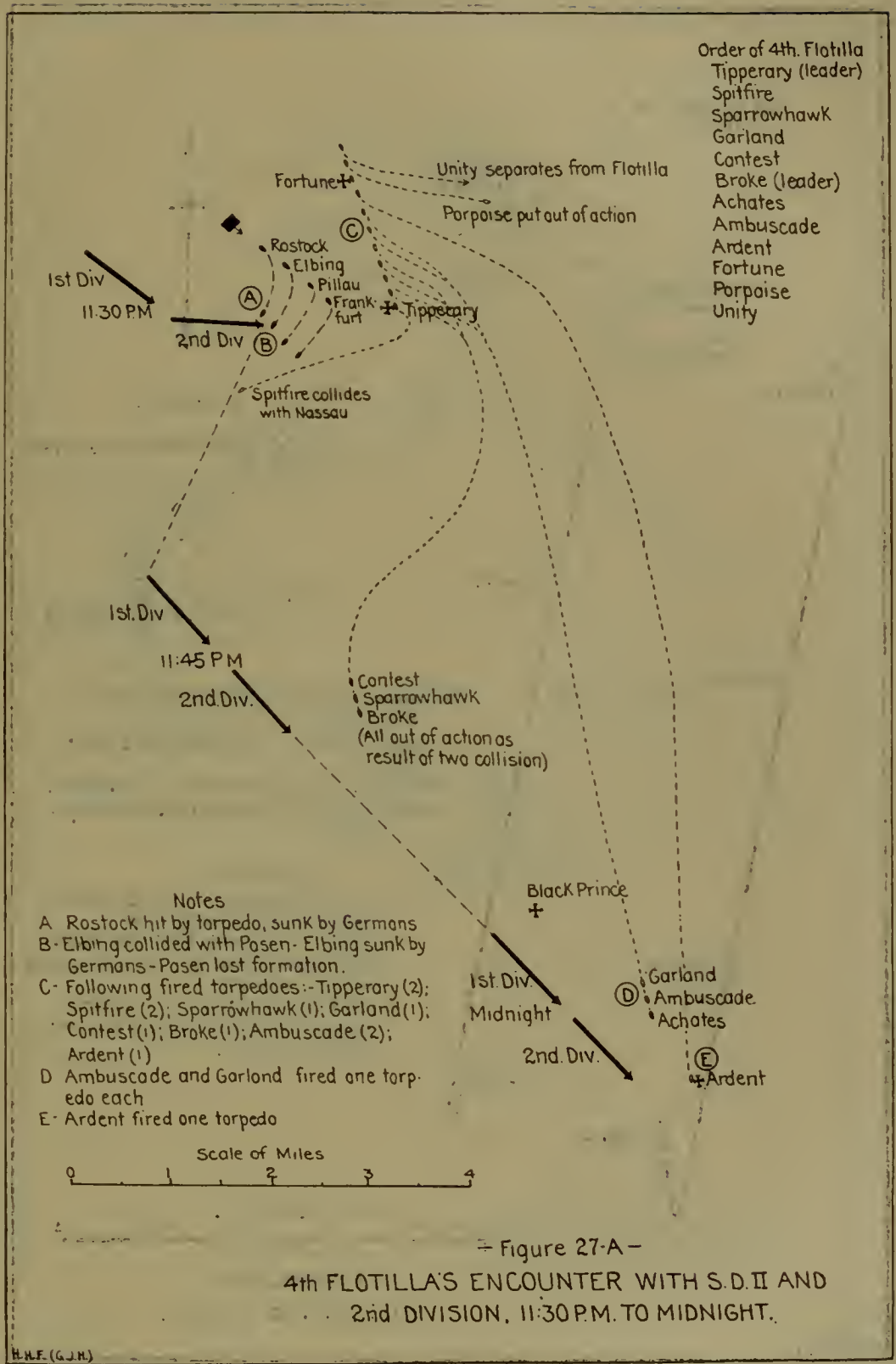


÷ Figure 26 ÷

POSITIONS OF GRAND AND HIGH SEA FLEETS.
10:30 P.M., 31 MAY 1916.

÷Figure 27÷

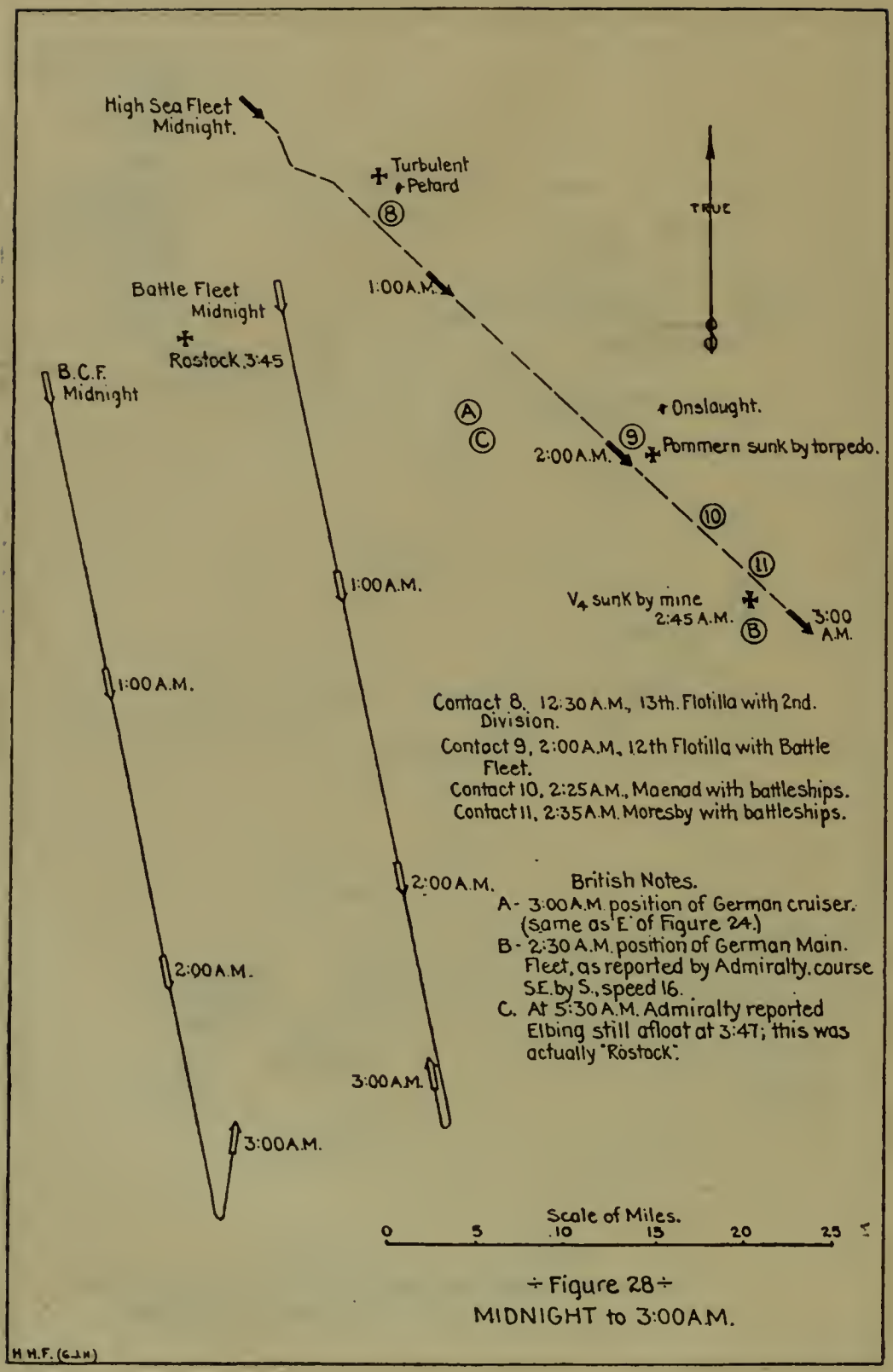
POSITIONS OF GRAND AND HIGH SEA FLEETS.
11:30 P.M., 31 MAY 1916.



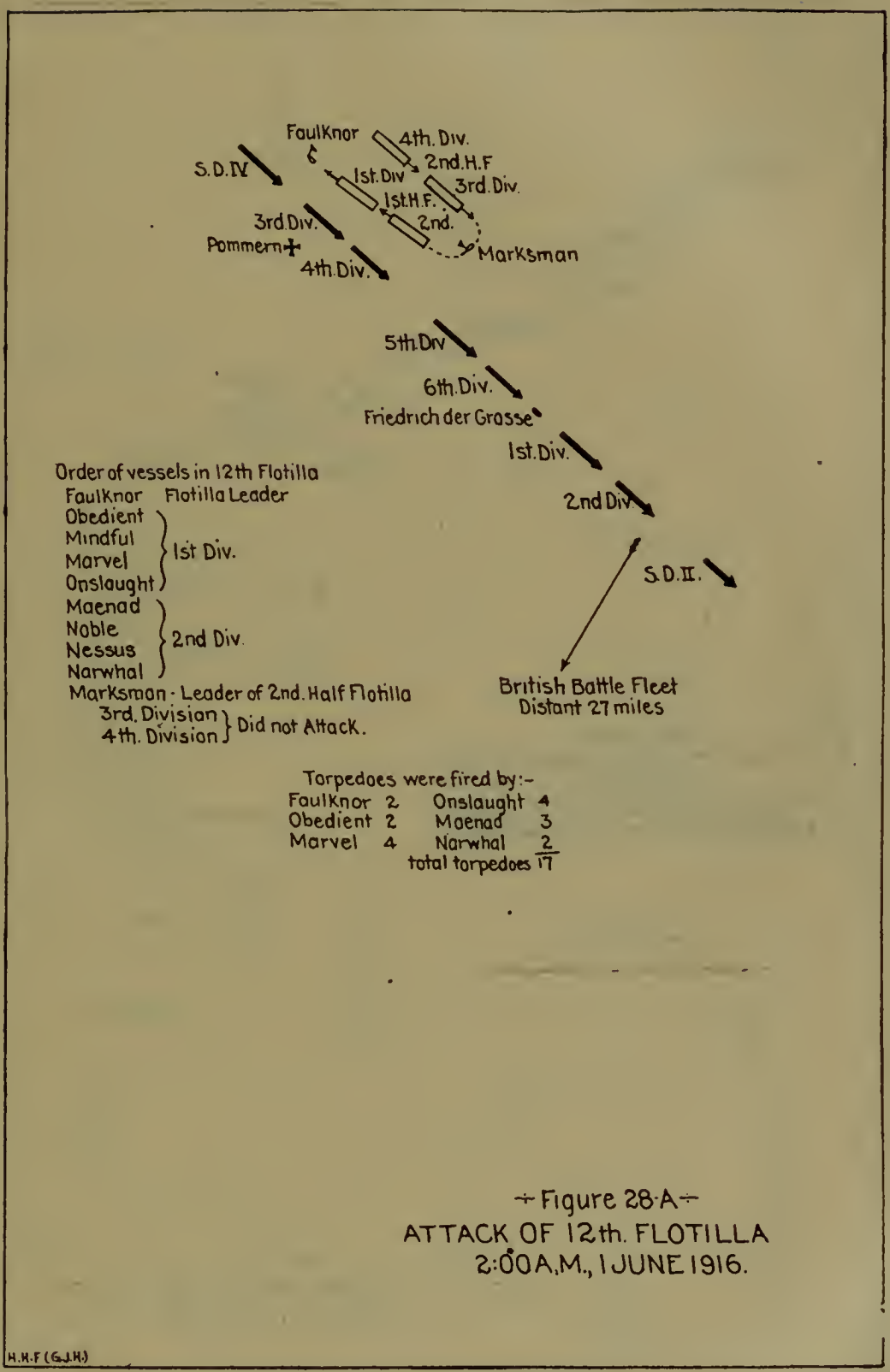
– Figure 27-A –

4th FLOTILLA'S ENCOUNTER WITH S.D.II AND 2nd DIVISION, 11:30 P.M. TO MIDNIGHT.

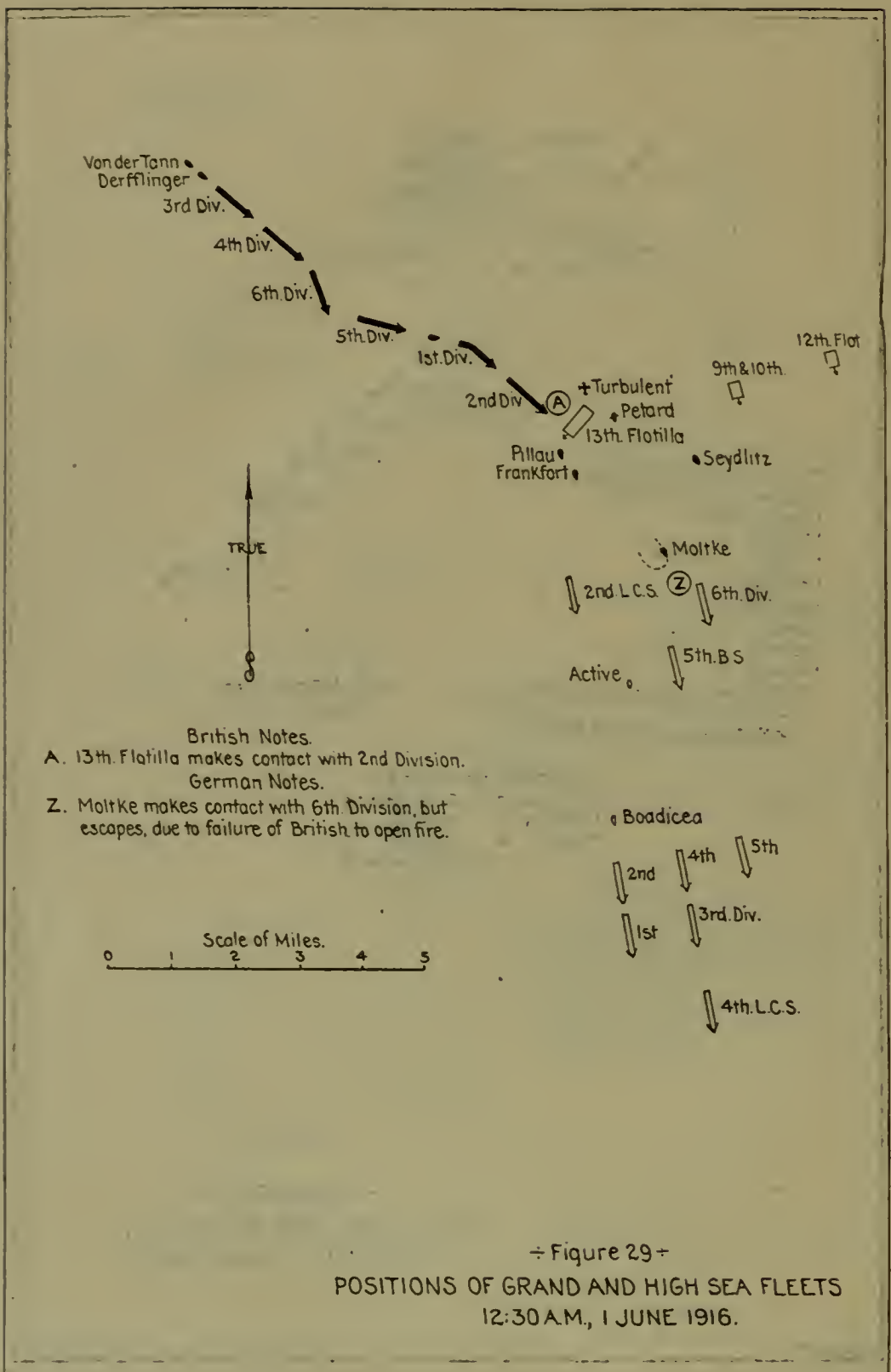
H.H.F. (G.J.H.)



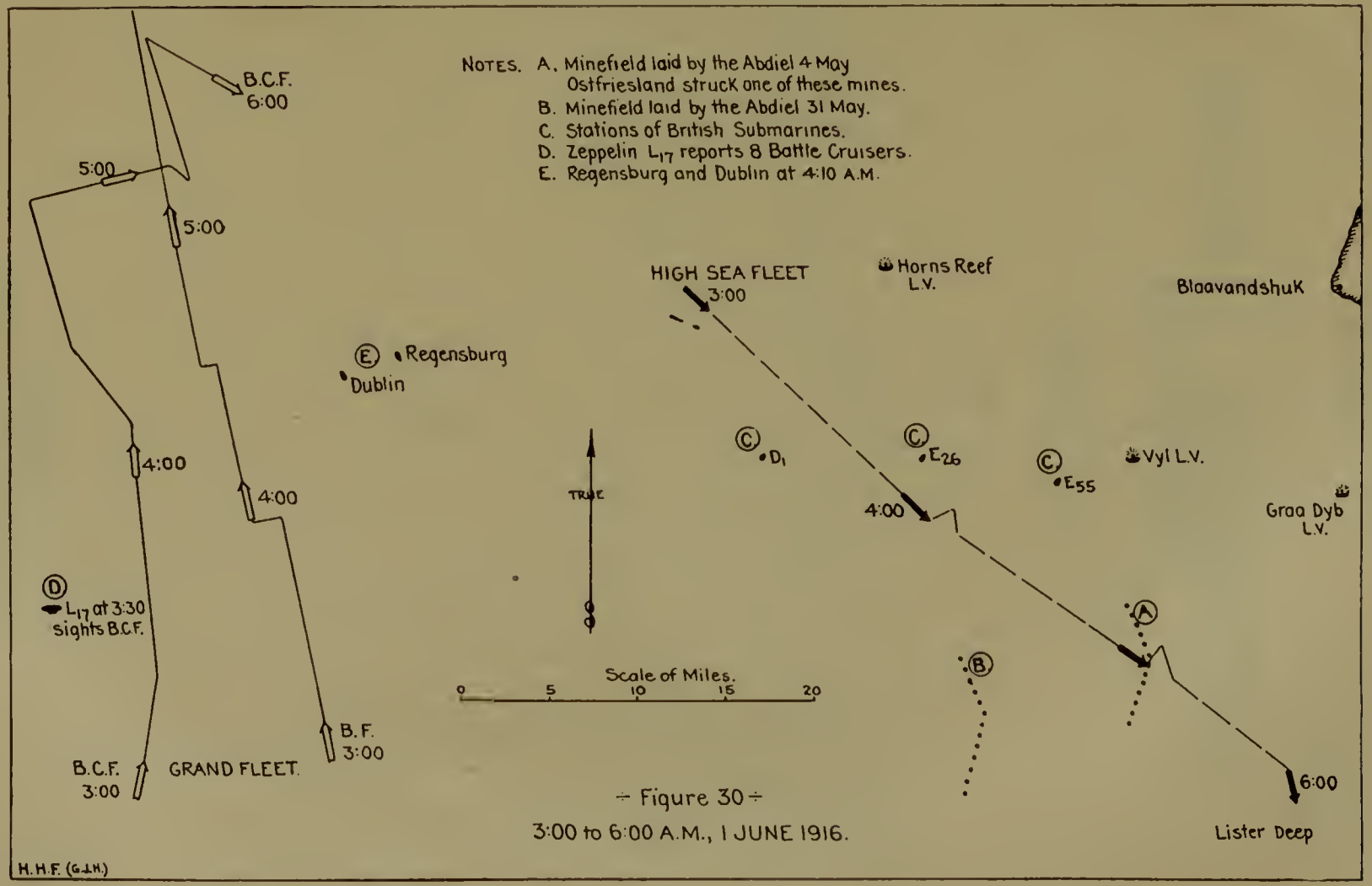
÷ Figure 28 ÷
MIDNIGHT to 3:00 A.M.



÷Figure 28·A÷
ATTACK OF 12th. FLOTILLA
2:00A.M., 1 JUNE 1916.



÷ Figure 29 ÷
POSITIONS OF GRAND AND HIGH SEA FLEETS
12:30 A.M., 1 JUNE 1916.



÷ Figure 30 ÷

3:00 to 6:00 A.M., 1 JUNE 1916.

OFFICE OF NAVAL INTELLIGENCE.
NAVY DEPARTMENT.
Washington, D. C.

MONTHLY INFORMATION BULLETIN.

NUMBER 4—1924.

APRIL, 1924.

DISTRIBUTION:

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines.

WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

CONFIDENTIAL.

OFFICE OF NAVAL INTELLIGENCE.

MONTHLY INFORMATION BULLETIN.

NUMBER 4—1924—APRIL, 1924.

FOR CONVENIENCE IN ROUTING.

Officer.	Initials.	Date received.	Date forwarded.
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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GREAT BRITAIN.

CAPITAL SHIPS IN RESERVE.

February, 1924.

Upon completion of the combined exercises of the Atlantic and Mediterranean Fleets about the middle of March, the battleships *Ajax* and *Centurion*, which are in commission with reduced complements under the scheme of economy adopted in 1922, are to return to England to join the reserve fleet. The *Centurion* is to pay off and recommission with a Portsmouth reserve crew, as flagship of the vice admiral commanding the reserve fleet, in place of the *Courageous*.

The commencement of dockyard work of converting the *Courageous* into an aircraft carrier is being deferred until the end of April for this purpose.

The battleship *Thunderer*, seagoing training ship for cadets since May, 1921, is to reduce to reserve fleet status at Portsmouth as soon after April 17 as possible.

Comment.—The above information was first made public in press notices from the home dockyards. The action relative to placing several capital ships in reserve was only recently decided upon, and in order to comply with the policy of the new Labor Government to reduce the naval estimates for the coming year. This decision to increase the ships in reserve by three battleships was the readiest means of meeting the situation that confronted the Admiralty in reducing the estimates.

It is to be noted that the *Centurion* and *Ajax* have been in active service with reduced complements. Also, there have been indications that the British enlisted personnel were not satisfied with the amount of duty in home ports, and that considerable difficulty was experienced in forming the crews when ships commissioned. As a further indication of this, there was a comment that many of the long-standing customs, such as allowing flag officers at dockyards to select their own coxswain of the barge, no longer obtained.

The first effect of the reduction in the number of battleships in active service is to reverse in one important particular the policy of the late Government with regard to the increase of the Mediterranean Fleet.

GREAT BRITAIN.

ESTIMATE ON THE EMPIRE.

(Less Canada and Newfoundland.)

October, 1923.

[Prepared by a committee at the Army War College.]

I. Military Aspects of the Geographical Situation of the British Empire (Less Canada and Newfoundland) and of its Physical Geography.

1. GEOGRAPHICAL SITUATION OF THE BRITISH EMPIRE.

The British Empire includes approximately one-fourth of the land surface of the globe. There are five major geographic divisions, viz, the British Isles, Canada, India, South Africa, and Australia and New Zealand; and numerous colonies, protectorates and spheres of influence adjacent to the major divisions or along the ocean routes between them. The great distance separating the major divisions have made it imperative for the Empire to establish and protect these ocean routes.

The de facto British Empire, therefore, includes:

(1) Five major divisions together with certain adjacent territories acquired for protection of frontiers or for the promotion of trade; and

(2) Ocean lines of communication between the major divisions together with a system of fortified bases and harbors for the maintenance and protection of the same.

2. GEOGRAPHICAL SITUATION AND PHYSICAL GEOGRAPHY OF THE COMPONENT PARTS OF THE BRITISH EMPIRE.

(A) MAJOR DIVISIONS.

(1) *The British Isles.*—The climate is milder than that of Europe and suitable for operations throughout the year. The east, south of Yorkshire, and south coasts of England are generally favorable for landing operations, except the mouth of the Thames. Great Britain is highly industralized at the expense of agriculture. She produces about 40 per cent of her foodstuffs, all her coal, and most of her iron ore. The remander of her food and raw material she must import. Her vital areas are London and north and west England. She is protected from invasion by her geographic isolation combined with her sea power. Should she lose command of the sea, no invasion would be necessary; she would starve.

(2) *India.*—She has no frontiers conterminous with those of any great military power. Her northwest frontier is the only one of strategic importance. It is protected by Persia and Afghanistan, both British spheres of influence. Its southern boundary is the Indian ocean which, with the completion of the projected improvements in the naval base of Singapore, will become practically a British lake. Her principal sea route to the British Isles is via the Suez, with the longer Cape of Good Hope route as an alternative.

(3) *South Africa.*—As a result of the treaty of Versailles, British possessions now extend from the Cape of Good Hope to Egypt. There are frontiers conterminous with French, Belgium, and Portuguese Colonies, but they are unsuited to invasion and incapable of a serious threat without overseas assistance. Its routes to the British Isles are via the Cape of Good Hope and via the Suez.

(4) *Australia and New Zealand* are the most isolated parts of the Empire. Much of Australia is desert; its vital area is the east and southeast. Both are insular dominions and can be invaded from overseas only. Their main sea routes to Great Britain are in order of importance: The Suez, the Cape of Good Hope and the Pacific-Atlantic routes.

(B) Protectorates, Spheres of Influence, and Minor Dependencies.

(1) Mediterranean-Indian Ocean-Far East route. Gibraltar, Malta, and Cyprus control the Mediterranean; the virtual protectorates of Egypt and the Near East secure the Suez Canal; the Indian Ocean may be considered a British lake; Singapore and Hongkong extend the route to China. Mesopotamia, in the Near East, is of strategic importance because of its position at the head of the Persian Gulf and across the narrow neck of land between that Gulf and the Caspian Sea, connecting Europe and southern Asia. It comprises the valleys of the Euphrates and Tigris with frontiers that are defensively weak and, from a military standpoint, is a liability.

(2) On the Cape of Good Hope route are St. Helena and Ascension Islands in the west and the Seychelles and Mauritius Islands on the east coast of Africa, connected by a chain of defended bases and fueling stations on the African mainland. The strategic importance of this route would be materially increased if the Suez route were lost.

(3) In the western Pacific, British insular possessions serve as outer defenses of Australia and New Zealand. They are included, however, in the status quo area of the Washington conference treaty.

(4) In the western Atlantic, Bermuda, British West Indies, and British Honduras flank the Panama Canal and the sea routes between the east coasts of the two Americas.

90380—24——2

(c) STRATEGIC ASPECTS OF GEOGRAPHIC FACTORS.

(1) Sea power is essential to the existence of the Empire and to the lives of the inhabitants of Great Britain. The sensitive areas of the Empire are her sea routes. They become vital as they converge off the British Isles.

(2) The major divisions of the Empire are remarkably free of weak land frontiers and consequent danger of invasion.

(3) Mesopotamia, because of her strategic geographic location and weak frontiers, is a source of military weakness.

3. FOREIGN POLICY AS AFFECTED BY GEOGRAPHIC FACTORS.

The foreign policy of the Empire will be to control the main trade routes of the world, and to prevent the control by any other nation of salient strategic centers on sea routes.

4. RELATION OF GEOGRAPHIC FACTORS TO POTENTIAL ENEMY STATES.

a. Sea power is the foundation stone of the imperial structure. The nations capable of seriously challenging British sea power may be limited to three: France, Japan, and the United States.

(1) *France.*—The geographic location of France enables her to strike by sea and air at the vital area of the British Empire—her ocean routes adjacent to the British Isles. On the other hand, Great Britain can cut sea communications between France's Mediterranean and Atlantic coasts and attack her sea communications with her African colonies. Great Britain would hardly undertake a serious landing on the French coast without a strong continental alliance. Her possible allies would be Germany and Italy.

(2) *Japan.*—The geographic situation of Australia and trade rivalry in China make Japan a potential enemy of the British Empire in the Pacific. War between them is improbable until the more acute situation between Japan and the United States has been finally adjusted. Should the latter involve war, the British Empire will be neutral as far as the safety of Canada will permit, but will not hesitate to take such action as the integrity and the interest of the Empire demand.

(3) *United States.*—In any war with the United States, Canada, with her exposed southern frontier and North Atlantic lines of communication, is the vital British possession. British West Indian colonies flank the Panama Canal, the only salient strategic center of ocean routes not controlled by the Empire. Japan as an ally would greatly assist the British in gaining and maintaining sea supremacy in the Atlantic, and would imperil United States possessions in the Pacific. War with the United States is improbable.

(b) *Near East.*—Mesopotamia's geographic location is strategically important, but its frontiers are tactically weak. Factors, other than geographic, make it a threat to the internal and external peace of the Empire. These factors are, racial, religious, Turkish nationalism, and trade rivalries in the Near East, particularly as between Great Britain and France. In a Near East war the Empire's only probable ally is Greece. Her probable enemies are Turkey, the remainder of the Moslem world, including her own subjects in the Near East, India and Africa, and Russia. This is the British Empire's most imminent threat of war.

II. The Political Situation.

A. INTERNAL CONDITIONS.

1. SOCIOLOGIC FEATURES.

(a) *The total population* is about 436,000,000; there are 318,000,000 brown people, 52,000,000 black, 9,000,000 yellow and 56,500,000 white; of the latter, 44,000,000 are in the United Kingdom.

The whites are not uniformly Nordic but are homogeneous and there is no better racial stock. The other races are hetereogeneous, racially and in most other respects, but there is similarity in certain large groups.

(b) *Psychological factors.*—Within the Empire are 220,000,000 Hindus, 90,000,000 Moslems, and 80,000,000 Christians. Religion is highly important because Mohammedanism is a social, political and even a legal institution. Currently, it is a troublesome and powerful influence in the Empire's internal affairs.

The whites are physically strong and enduring; their mentality is particularly marked by common sense and adaptability. They are energetic, resourceful, tenacious and apt at governing themselves or aliens. They are not emotional and are neither susceptible or prone to use of propaganda. Education is adequate. Psychologically, the nonwhites vary extremely.

In war, no people excel the British; adverse to military training in peace, they start slowly; but they have all the military virtues, and they excel in bearing reverses. Political leadership is efficient. Of the colored races, some portions are good fighting stock and have combat value when led by whites; their potentiality is highest in the Tropics.

(c) *Nationalism* exists in high degree among the whites, but those in the Dominions apply it mainly to their own countries. Among the nonwhite groups there is in places considerable loyalty to the Empire, but on the average it is weak.

(d) *The Western Atlantic* contains about 2,000,000 people; there are a few whites, 250,000 East Indians and the remainder are black

or mulatto. The quality is generally poor, being best in Bermuda and the Barbadoes. Those two colonies are highly loyal; the others are indifferent, but the people prefer the British to us.

2. GOVERNMENT AND POLITICAL INSTITUTIONS

(a) *The United Kingdom.*—The real executive is the cabinet, centering in the Prime Minister; all ministers have seats in Parliament. Few powers remain in the House of Lords, and the real legislative authority lies in the House of Commons. The cabinet can make war or peace, and enter into treaties; but it is immediately and effectively responsible to Commons.

The present "government" is Conservative, that party having won the last election and holding 350 seats. The Labor Party is now the "opposition," but there are no decided party issues. Leaders are Premier Baldwin, Lord Curzon, and Mr. McDonald.

(b) *The colonies* are administered under a cabinet minister through appointive governors whose status varies greatly. In some colonies there is virtually no popular representation, while in others local legislatures exercise real powers. The trend is toward autonomy. Protectorates also are under the Colonial Secretary.

(c) *India*, not a colony but an Empire, is under a separate cabinet minister. The Viceroy of India manages the protectorate over the Indian States. There is little representation of the people anywhere, but elected Indian legislatures are beginning to function, and the trend is toward Dominion status, corresponding to the announced policy of the Home Government. India is considered an essential to the integrity of the Empire; the British can hold it indefinitely only if the economic state of the people improves.

(d) *The Dominions* have for their internal government practically the same structure and political institutions as the United Kingdom. The political situation and most important leaders are:

Australia.—The Labor party won the last four elections, but the cabinet is a coalition of the other two. There are no vital party issues and all stand for a "white Australia." Leaders are Premier Bruce, Mr. Earle and Ex-Premier Hughes.

New Zealand.—The politics have long been stable and with no important issues. Premier Massey has held his office for 19 years.

South Africa.—Politics are in flux and rather intense. The National Party is squarely opposed to the policies of the South Africa party but is not now actively pushing its secession idea. In the approaching election there is possibility that General Smut's party will lose. His opposing leader is General Herzog.

Irish Free State.—The Government party won the last election and, although the Republicans won a quarter of the seats, the status as

a Dominion is probably settled. The only other important issues concern the relations with Ulster.

(e) *The Imperial Conference.*—The British Empire has become the "Commonwealth of nations," and the conference is the only effective binder that remains. The idea of a federation or imperial superstate stands definitely rejected and is succeeded by that of imperial cooperation among coequal nations. That amounts to little more than an alliance. A conference is now in session.

(f) *General.*—The British are not good haters: without specific reason, their attitude toward other peoples does not go beyond contemptuous tolerance. In war, elements of weakness are:

The estrangement of most of Ireland: the possible disaffection of South Africa: the loose control over the colonies as well as the Dominions: the internal troubles and discontent of subject peoples, particularly in India: and the effects of unemployment and heavy tax burdens in the United Kingdom.

B. FOREIGN RELATIONS.

1. The foreign policies of the British Empire are strongly economic, and in order to promote and insure her economic position, she must have an ambitious military and naval policy. Economically she desires to increase her trade and to that end must continually acquire new sources of foodstuffs and raw materials, which in turn means that she must increase the present or find new markets. The Empire desires to be commercially self-sustaining and all-sufficient for England and the Empire's needs. The present British Government, "a business cabinet," is relied upon to support this move. In order to assure her economic position, she must be prepared to defend her outlying as well as her home possessions, not only in case of war but in the pursuit of trade. Sea power is the determining factor of their foreign policy.

2. There are three outstanding foreign problems to which Britain is required to give a great part of her attention at this time:

(a) Continental Europe—Britain desires to see Germany and central Europe again opened to her as trade centers. France, through her desire to crush Germany and by her domination of Poland, friendly relations with the "Little Entente," and preponderance of the air, is fast approaching a position in which she will have a balance of power in her favor. Britain will attempt to thwart her by insisting upon the stabilization of Germany and by forming friendly relations with other European States and enlarging her air program.

(b) The Near East—Britain's position here is a combination of trade and protection and is probably more critical at this time than

at any other place. She desires unlimited and unhindered access to trade and the right to develop the natural resources of these countries. She desires a land route to India and the protection of her present trade routes. The advance of Russian Communism to the south, toward India, must be stopped and the Mohammedan menace controlled. The latter she hopes to accomplish through the strengthening of her influence in this territory.

(c) The Far East—The Japanese look with disfavor upon the establishment of the Singapore naval base and believe it not in keeping with the Washington treaty. They also oppose the British policy of international control of Chinese finances and the placing of guards on and control of their railroads, as this would mean the domination of Chinese trade by the British.

3. The British foreign policy has as its particular motive—trade. Her policies conflict with those nations which need a world-wide equality of trade and emigration, such as Japan, Italy, and Germany, and accord with those which need the protection of her sea power, such as Greece, Chile, and Portugal.

Her most probable enemies are France, Germany, Russia, Japan, and the United States.

Her most probable allies are Italy, Greece, and in case of war with the United States—Japan.

In case of war between United States and Japan her attitude probably would be neutral.

In case of war between United States and Mexico her attitude neutral.

Her foreign policies are very near the real wishes of the people.

III. Economic Situation.

A. FOOD.

Neither the British Empire nor the United Kingdom produce enough food for their own consumption, although the larger subdivisions, except the United Kingdom, are practically self-sustaining, noticeably Canada, Australia, New Zealand, and British South Africa.

The United Kingdom imports 60 per cent of her food supply, including 70–80 per cent of wheat, and fully one-half of all meats consumed. She is the largest importer of foodstuffs in the world. Importations of foodstuffs now approximate pre-war levels. Her colonies can supply the bulk of her foodstuffs, except sugar and coffee. Forty-eight per cent of the total British importations in 1922 were for foods, against 53 per cent in 1921 and 36 per cent in 1913.

Food exports are almost negligible, amounting to but 5 per cent of total exports in 1922, against 4⅘ per cent in 1921 and 5 per cent in 1913. Fish constitutes the principal food export.

The total agricultural area of the United Kingdom comprises 62,292 acres. Approximately 22 per cent of the total area is under cultivation, of which 12 per cent is normally devoted to the raising of grain crops. Four per cent of the total area is forested, 59 per cent consists of meadow and pasture lands, while 15 per cent is waste land. Roughly, 50 per cent of the total area is capable of cultivation. During the World War the area under cultivation in grain crops increased 25 per cent.

But 5 per cent of the total population is engaged in agriculture. Efforts have been made since the war to increase the production of essential food articles both in the United Kingdom and in the colonies, but little has been accomplished in this direction as yet.

British agriculture is now in a state of stagnation, the gains made in the war in this respect not having been maintained. There is a distinct tendency toward decline in average planted and an increase in meadow and pasture land. Agriculture will continue to decline as long as the present governmental apathy toward agriculture and excessive taxation of arable lands continue.

With reference to home production, the United Kingdom produces 95 per cent of potatoes consumed, 100 per cent of fish, 23 per cent of wheat, 64 per cent of barley, 88 per cent of oats, 50 per cent of meats, 43 per cent of butter, 25 per cent of cheese, and a very large percentage of the green vegetables. She is dependent altogether upon her colonies or upon other countries for her supply of tea, sugar, coffee, maize, and rice. The bulk of her imported wheat comes from the United States, Australia, and Canada; barley from the United States and Canada; oats from Canada and the Argentine; meats from the Argentine, New Zealand, the United States, and Australia; butter from Denmark, Australia, and New Zealand; and tea from the Malay States, India, and Ceylon.

Prior to the World War, Great Britain obtained the bulk of her sugar supply from Germany and Austria-Hungary, and a large percentage of her grain from Russia. These pre-war sources have been entirely eliminated, but with the reconstruction of these countries they may again figure in the food supply of the British Isles.

The United Kingdom and the British Empire are dependent for existence on command of the sea and on the ability to maintain British shipping in international trade. Any power threatening either of these invites war. The most effective means of depriving the United Kingdom of essential foodstuffs from the outside world would be to cut her communications close in around the British Isles where her trade routes converge.

A war alliance between the United States and France against Great Britain would have a more serious effect on British foreign trade than any other combination.

The vital food areas of the United Kingdom are not those in which the principal home crops are grown, but are those ports of entry where the bulk of imported food supply is landed or stored, viz, London, Liverpool, Cardiff, Glasgow, and other lesser ports.

The British Empire furnishes the United Kingdom with 50 per cent of her imported food supply. Australia, New Zealand, Canada, and British South Africa are self-sustaining, except for sugar, tea, and coffee. British India is subject to severe famine which makes the food supply uncertain. Mauritius, Ceylon, and the Fiji Islands are of importance economically to the United Kingdom and the Empire because of their exports of sugar, tea, molasses, and fruits. They are not self-sustaining, nor are the balance of the British Possessions.

The British West Indies, economically, do not play an important part in the world situation of either the United Kingdom or the British Empire.

B. INDUSTRIES AND MUNITIONING CAPACITY.

The United Kingdom imports the bulk of raw materials used, except coal and a portion of the iron ore. All the cotton, sulphur, potash, copper, natural nitrates, rubber, and about 30 per cent of the iron ore used are imported.

Great Britain is independent of outside sources in regard to coal. Enough coal is produced to supply her own needs and to form one of her principal export items.

Seventy per cent of the iron ore consumed is of home production, the balance being imported principally from Spain. Coal and iron ore are the only important raw materials produced at home.

The national existence of the United Kingdom and of the British Empire is dependent on the exchange of manufactured products for raw materials and food. The great sea routes supplying the British Isles with foodstuffs are those also supplying raw materials. Great Britain's raw materials imports supply her great manufacturing industries, which in turn produce the manufactured products used so extensively in her international trade.

Provided Great Britain can retain control of the sea, she can produce all the munitions necessary for any war in which she may become involved. In 1914 she had but three munitions factories or arsenals. This was increased to 302 in 1918 and in addition some 20,000 other factories were engaged in munitions work exclusively.

Output of iron and steel in 1922 was nearly five million tons of the former and pretty close to the same amount in steel castings and ingots. In 1922 Great Britain exported more steel than any other country in the world. Fifty-two per cent of this went to British possessions.

In the event of another war in which Great Britain may become involved, the organization of her industries and methods used during the late war can be duplicated.

Great Britain is able, through her industrial exports, to build up a foreign credit which will insure her supply of raw materials and food, provided she maintains control of the sea. Her textile industry is of vast importance in the economic life of the Empire. Great Britain is a vast industrial center, with highly organized and well equipped factories, and with a great merchant fleet to transport her manufactured products to all corners of the globe. She has built up a great commercial system with agents in every land. Her possession of colonies and dependencies supplies a favorable market for her products and forms a favorable source from which to secure raw materials and food. At the present time British trade is reviving and her industries are in a prosperous condition.

The British West Indies are of little importance in supplying raw materials or food to the United Kingdom or the British Empire.

C. FOREIGN COMMERCE.

British imports for 1922 were £1,004,000,000 and exports £824,000,000 with excess of imports of £180,000,000 compared with £134,000,000 for 1913. Compared with 1921, total trade was 3½ per cent less in value but over 20 per cent greater in volume. Compared with 1913, the value of 1922 trade was 30 per cent greater but the volume was about 20 per cent less.

Compared with 1913, exports of iron and steel fell off 30 per cent, cotton piece goods fell off 40 per cent, and woolen and worsted tissues increased 10 per cent, while imports of grain and flour decreased 20 per cent, and of meats increased 14 per cent. The relative trade with the Empire remained constant. Relative trade with Canada and South America decreased.

British invisible exports (income from investments, shipping, and insurance charges, etc.) are estimated at £254,000,000 compared with £344,000,000 for 1913, and the balance of trade after deducting excess of imports of merchandise and bullion, was £62,000,000 in Britain's favor as compared with £193,000,000 for 1913.

British net capital investments in the Empire and in foreign countries, excluding amounts owed Great Britain by allied powers, is about 60 per cent of the pre-war amount. The income from this

investment is half the pre-war income and is now £100,000,000. British net capital investments since the war have not appreciably increased. We may expect an increase in the future.

Prior to the war half of Britain's capital available outside the United Kingdom was taken by the colonies. In 1922 60 per cent was taken by the colonies.

Great Britain has not regained its South American markets.

The United States is now a creditor to Great Britain and is the greatest competitor of Great Britain in exploiting the resources and trade of the American continents.

D. FINANCE.

British debt, £7,730,000,000, is now £150,000,000 less than the peak debt in 1920. No reduction made in gross debt during past year. Estimates for 1923–24 provide for a sinking fund of £40,000,000. During the past year the floating debt has been reduced by £220,000,000 to £809,900,000. The debt to the United States has been fixed at $4,604,128,085, and arrangements made to pay it with interest by annual payments extending over 62 years. Many of the war issues have been refunded in new long-term bonds at 3½ per cent interest. These operations have resulted in a reduction of interest charges by £39,600,000 since 1920.

Ratio of taxation to income is now about 18 per cent, compared with approximately 9 per cent in the United States (1921) for national and State taxes. In the coming year it is proposed to reduce the income tax and the corporation profits tax. Total estimated revenues are £818,500,000 in comparison with £1,426,000,000 for 1921.

Currency in circulation has been reduced by about £50,000,000 since January 1, 1922. Gold reserve remains the same. This deflation of currency taking place since January 1, 1921, has coincided with a period of economic depression. The average price index (Statist) has fallen from 295 in 1920 (100 for 1913–14) to 154 for 1922 and 147 on September 12, 1923.

Exchange rate in New York, which averaged $3.85 in 1921, averaged $4.43 in 1922, and was $4.52 on September 6, 1923.

E. COMMUNICATIONS.

Roads.—Highway system of United Kingdom consists of 236,000 miles of road, mostly one track macadam. Main roads between larger towns being widened and resurfaced. System will be adequate when these improvements are completed.

Larger towns of Union of South Africa are connected by improved roads. Very few roads away from coast.

Principal cities of India are connected by improved roads which, lacking many bridges, are impassable except in dry season, December to March. Road system is inadequate.

Except in Queensland, Victoria, and New South Wales, there are very few roads in Australia. Roads of these States are inadequate, but are to be improved.

Railroads.—Railroad system of United Kingdom, except Ireland, is adequate in all respects and highly efficient. Ireland's railroads are in poor condition.

Cape to Cairo Railroad has long gap south of El Obeid and several short ones along Congo River. It is connected by Palestine Railroad with Berlin-Bagdad Railroad; also connects with Hedjaz Railroad. Cairo, Alexandria, and Port Said are connected. Branch goes to Port Sudan.

In the south, principal towns are connected. Branches run to ports of southwest African protectorate, Lorenzo Marques, and Beiro. Efficiency is reduced by lack of common gauge.

Iraq Railroad runs from Basra to Shergat (187 miles north of Bagdad). Gauge changes at Bagdad. Gap of about 50 miles exists between Shergat and Nisibin, eastern end of Berlin-Bagdad Railroad.

Many railroads in India, principal cities connected. Great belt along northern border and less dense net on northwest border. Principal systems employ same gauge. Many narrow-gauge systems. Efficiency not high, and facilities are insufficient.

Australia has east-west transcontinental line; north-south line is under construction. Fair net in Queensland, Victoria, New South Wales. Elsewhere facilities are poor. System's efficiency seriously impaired by use of many gauges.

Commercial aviation.—British lines connect London with Manchester, Paris, Havre, Cherbourg, Brussels, Amsterdam, Hamburg, Cologne, and Berlin; 96 planes employed last March. Lines to Switzerland and India are planned. Geraldon-Derby and Charlesville-Cloncurry lines in Australia; 50 planes in service. Many new lines planned. Mail planes run from Cairo to Bagdad. All lines are efficiently operated.

Animals.—United Kingdom's supply of horses and mules is inadequate for war needs. India and Australia can furnish large numbers of horses, and South Africa both horses and mules.

Automobiles.—Excepting Canada, the only factories in the empire are in United Kingdom. Annual capacity, 25,000 cars and 5,000 trucks; 126,000 army trucks have been disposed of since 1918. Until domestic production is largely increased, trucks for war needs must be imported.

Waterways.—Inland waterway system of United Kingdom is extensive, but Manchester Ship Canal, which handles very heavy traffic, is only important route in use. The navigable rivers and canals of Egypt, Iraq, India, and Australia carry great amounts of tonnage. These waterways have important potential value in war.

The Suez Canal is a highly important waterway to the Empire. Loss of its use would result in serious delays and necessitate a large increase in tonnage.

Telegraph.—United Kingdom's system connects all cities and towns of importance and is adequate for all purposes. 75 per cent of the lines are underground. The principal cities of dominions and colonies are connected and these systems are considered adequate. In Australia submarine cables connect most of the ports.

Telephone.—One million telephones are in use in the United Kingdom. Trunk lines connect the numerous ports and cities. Most of the lines, urban and interurban, are underground. All large colonial cities have telephone systems, but there are relatively very few interurban lines. The United Kingdom has telephone cable connection with Ireland, Holland, Belgium, and France.

Cable and radio.—Although Great Britain owns over 50 per cent of the world's cables and owns or controls most of the important cable centers and landing places, its cable facilities are inadequate. Cooperation between the cable and radio companies has recently been arranged. A radio system furnishing direct communication between England and the dominions is being installed. Stations are in operation in the United Kingdom, at Cairo, Windhuk, and Perth, and one at Bombay is being completed. Others are to be at Nairobi, Singapore, Hongkong, Port Darwin, and Bagdad. With this system completed the communication problem of the Empire should be near a solution.

Ocean shipping.—The principal British trade routes and the percentage by money value of the British trade over each in 1922 are:

1. Mediterranean-Suez route ---------- 42%
2. Western Europe route ---------- 21%
3. North American route ---------- 20½%
4. South American route ---------- 7%
5. West and South African route ---------- 4%
6. Central American route ---------- 2%

Critical points along these routes are: The Straits of Gibraltar, Suez Canal, Straits of Bab el Mandeb and Straits of Malacca.

Ports.—The Empire is provided with excellent well-equipped ports in all parts of the world. Dry docks and ship repair facilities are provided at all principal and many other ports.

Fuel ports.—Coaling stations are located at all ports of call of any importance in the Empire. Fuel oil stations are located at 93

of the more important ports. The number of these stations is increasing rapidly and the facilities are being improved.

Tonnage.—British tonnage, excluding Canada, consits of 9,531 steam vessels of 20,613,000 gross tons and 675 sailing vessels of 244,700 gross tons and constitutes 31 per cent of the world's tonnage. Britain owns 372 fuel-oil tankers of 1,783,000 gross tons, or 37 per cent of the total world tanker tonnage.

Capacity to transport and maintain troops.—The British merchant marine, after furnishing sufficient tonnage to meet the economic needs of the Empire and maintain the Navy overseas, will have sufficient tonnage available to transport and maintain a force of 3,300,000 men in a theater of war requiring a 60-day turn around.

IV. Military Situation.

A. PERMANENT MILITARY AND NAVAL ESTABLISHMENTS.

The permanent war establishment of the British Empire includes three coordinate branches—Army, Navy, and Air Forces—loosely controlled by the committee of national defense. The nation, through Parliament, actually directs this machine. Annual expenditure is based on a policy of imperial defense as a whole. The task of protecting the British Empire is accomplished by distribution of forces in a weak line of far-flung outposts and concentration of a strong central reserve at home. All branches are charged with peace development and war expansion in addition to special rôles.

Army combat power is based on an infantry division of about 18,500 all ranks, war strength. It has less small arm and artillery fire power, about equal shock action, and more mobility than the United States division. Sea power as measured in ships, bases, and personnel is at least the equal of any power. Air power as measured in fighting ships, air bases, and personnel is rapidly exceeding our own.

Organization of war establishments is complicated. Army permanent establishment at home consists of regular army (six infantry and one cavalry divisions, the bulk of which is immediately available as an expeditionary force) and territorial army (14 infantry divisions and other troops available for service abroad only by act of Parliament). Established reserves bring both to war strength in an emergency. Special reserves and cadet units supply the great mass of officers required for war. Permanent cadres are apportioned to the various arms and services in proportions similar to those found in our Army. The infantry employs four-unit organization in lower echelons; cavalry, three-unit. Home army is allocated to six commands and two districts similar to our corps areas. Terms of service are 12 years (active and reserve) in regular army

and four years in territorial army. Other units considered available for Empire defense but not subject to direct call (India excepted) are the Indian Army, the Canadian, Australian, New Zealand, South African, and Irish forces. Navy includes an active and reserve list of officers and ships. It is allocated to eight stations which are subdivided into commands. Reserve fleet is from 10 per cent to 20 per cent manned. Air force reserve is now being constituted. Air forces, at home allocated principally to inland command and coastal command. Dominion navy and air appropriations are relatively small. Staffs of all branches are organized into two coordinate groups—operation and maintenance. The former is a general staff function.

Actual strength include Army (active, reserve, territorial, colonial, Indian, and dominion) about 480,000 all ranks, Navy (active and reserve) about 146,000, and Air Forces (active only) about 32,000. The Air Forces, alone, are increasing in active strength. Navy strength in 1922 included 22 capital ships, 63 light cruisers, 205 destroyers and 144 submarines. Fortified naval bases flank the important sea routes. Air strength includes approximately 500 planes (two-thirds fighting) in actual commission and nearly seven times that number (more or less serviceable) in reserve. Home air bases are at Gosport and Leuchars. Naval bases are potential or actual air bases. British policy favors the restriction of submarine warfare, but opposes restrictions on air objectives. British airplane carriers total 7 ships carrying more than 100 planes.

Equipment of all branches is modern and in process of development. That of Army is well adapted for service anywhere. Tank and antitank improvement is noticeable. Combat groupings reflect war experiences. Naval design and ordnance ranks with the latest. Oil storage facilities are being extended. Troop-carrying planes are an accomplished achievement.

Training is progressive and comprehensive. It includes joint operations. Army maneuvers this year are limited to staff exercises and troop training ends with the reenforced brigade. School system is complete and far-reaching. Opportunities exist for actual field experience in minor warfare. Tactical doctrine of all branches is essentially offensive. The Army particularly stresses individual leadership and moral ascendancy. Uniformity of training throughout the Empire is sought.

The Air Forces and Navy are depended on to cover the development of military strength in a major emergency. Comment in the House of Commons indicates a slower Regular Army mobilization than before the World's War.

No one branch is below the high standard of the establishment. All fought with distinction in the World War. The superior fight-

ing value of white troops is beyond question. Morale is not perceptibly weakened in the face of drastic personnel reductions.

Fortifications are efficiently installed and occupied. They bear an intimate relation to naval bases.

Armament and technical stores for maintenance of equipment and for training of Regular Army are still being drawn from surplus stocks. Air estimates were increased nearly $5,000,000, due almost entirely to necessity for replenishing equipment due to exhaustion of war stocks. The value of surplus stores sales since the Armistice total £322,229,839. The Navy is believed to be plentifully supplied for any probable emergency. War ordnance stores sufficient to equip 20 divisions were reported as stored, maintained, inspected, and guarded at home in 1922. The Geddes Committee recommended that complete war equipment be kept on hand for 5 infantry and 1 cavalry divisions, together with certain war stores for further number of divisions. It is believed that the Expeditionary Force (6 regular divisions) can be immediately fully equipped and that the 14 territorial divisions can be equipped as rapidly as mobilized.

The two most important British bases in the West Indies are Bermuda and Kingston, Jamaica.

The British Empire has a well organized, disciplined, trained, and equipped war machine capable of ready expansion and furnishing a solid foundation on which to base any probable war effort. The existing status of munitions and equipment is sufficient for any probable emergency.

B. POTENTIAL MANPOWER AND PROBABLE RATE OF DEVELOPMENT IN WAR.

1. The population of the British Empire (less Canada and Newfoundland) is approximately as follows: White, 56,500,000; other than white, 379,500,000; total, 436,000,000. We may assume for military purposes the Empire will depend mainly on its white population.

2. The military manpower (white) available to the Empire at the end of the World War was about as follows: United Kingdom (less Ireland), 4,000,000; Australia, 255,000; New Zealand, 100,000; South Africa, 121,000; other colonies, 10,000; total 4,486,000 (all trained). Since then this military manpower has decreased due to deaths or other causes and increased by five classes of young men coming of age, so that at the present time it is about 4,806,000, of whom about 3,646,000 are trained men.

3. During her greatest war, when her very existence was at stake, the British Empire, due to political and psychological reasons, raised only 1,524,187 men from races other than white. It is believed 1,750,000 men from races other than white may be considered the

maximum she would raise in a future war, of whom about 1,150,000 are trained.

4. Thus the total military manpower is about 6,556,000, of whom about 4,796,000 are trained.

5. Considering her efforts in the World War, the present strength of her permanent military forces, its discipline, training, and morale, we estimate:

(*a*) White men can be enlisted at the rate of about 442,000 per month at first, with a total enlistment (all races) at first of about 642,000 men per month. This would gradually become less and at the end of 12 months the bulk of the manpower then available will have been mobilized.

(*b*) One hundred and seventeen thousand white man (the regular army at home plus about 15,000 men from the Royal Air Force) are immediately available for action against a foreign enemy: this can be increased by 207,000 white men (Trained Reserves, Territorial Army and the militia) and 235,000 colored men (Indian Army, Indian Reserves, Natives in the Regular Army) the first month and by 332,000 white and 150,000 colored per month thereafter until a maximum of 4,600,000 white and 1,750,000 colored have been reached.

V. General Conclusions.

1. The sociological and political conditions internal to the British Empire are such as to make the risks of a major war incommensurate with the probable gains.

2. The foreign policy of the Empire centers tenaciously on the extension and the protection of its commercial institutions.

3. The United Kingdom and the Empire are not self-sustaining as to food and raw material, although, with the exception of the United Kingdom, the major subdivisions are self-sustaining as to food. All necessary munitions for a major war can be produced within the Empire as long as it controls the essential sea routes.

4. The United Kingdom has adjusted its finances to meet its national debt and is accumulating capital for foreign investment: it is capable of financing a major war.

5. The Empire's communications as a whole are sufficient for war purposes.

6. The Empire's current permanent war establishments, while generally efficient, furnish little indication of future military policy because of immediate pressing need for economy.

7. In a war of maximum effort, the Empire should be able to maintain an army of about 5,000,000 men, of whom about 3,600,000 will be white: she should be able to maintain in a foreign theater of war an army of about 2,500,000.

8. The most serious menace to the Empire's external peace and internal stability lies in the Near East. There are racial, religious, and economic as well as geographic causes: the latter particularly includes Mesopotamia's geographic situation with respect to the land routes to India and the tactically weak frontiers of the position.

GREAT BRITAIN.

USE OF DROGUES WITH SEAPLANES.

February, 1924.

The latest practice in the British service is to have two drogues as permanent equipment for twin-engine seaplanes. The securing lines are made fast to the lower ends of the diagonal struts extending from the lower plane to the hull, and the drogues are carried inside the mechanic's cockpit, the lines passing through the gun ports. The drogues themselves consist of canvas buckets with a hole in the bottom. They are put over by the mechanic on signals from the pilot, the purpose being to enable the pilot to use sufficient engine power to give a blast on the rudder and thus turn the seaplane without at the same time giving it too much speed on the water. Pilots state that this arrangement is of inestimable value in picking up mooring buoys or making runways in congested waters.

JAPAN.

BRIEF ESTIMATE OF THE PRESENT SITUATION.

The following estimate of the situation in Japan is made as of February 1, 1924:

NAVAL.

The opinion that prevailed for some time that the Japanese navy had been seriously crippled by the earthquake of September 1, 1923, is not justified by the actual damages incurred. It is true that the navy was a heavy loser, but not to the extent of jeopardizing the national defense. The Yokosuka Naval Station was badly damaged and it is estimated that 63,000,000 yen or more will be necessary to repair the station to its former condition. Even so, the station's capacity is not greatly reduced, as evidenced by the following work under way at Yokosuka:

The *Amagi* is being scrapped.

The *Kaga* is being converted to an airplane carrier.

The light cruiser *Myoko* has been ordered to be built there.

Submarine *No. 58* is building.

Submarine *No. I–58* is ordered.

Scrapping of the *Asahi*, *Mikasa*, *Satsuma*, and *Aki* is in progress and was undertaken since the earthquake.

Other items of naval damage are the loss of 70,000 tons of fuel oil, the damage to fuel-oil storage tanks, the destruction of the naval war college and other schools, the loss of the experimental station in Tokyo, the damage to the powder factory at Hiratsuka, and the damage to ships building. Of the above and other miscellaneous items of damage the loss of fuel oil appears to represent the heaviest blow and to be giving the authorities the most concern. It is not known exactly how much damage was done to the powder factory, but it is not believed to be as serious as at first reported. As to damage to ships building, practically no damage was done except in the case of the light cruiser *Naka*, which was ready for launching on September 1, 1923. This ship will have to be scrapped. The other ships which were on the ways in the earthquake region had just been laid, and consequently there was not much to be damaged. The shipyards suffered great losses by fire, but the capacity of the yards to build ships was not greatly reduced and no great delay is expected in the completion of the ships now on the ways. Thus it is seen that except as noted above the navy had no direct losses that could be said to seriously affect her present strength. It is her future strength that is most affected—the building program and the program for the reconstruction of capital ships. The budget for 1924 has not yet been presented to the Diet, but the appropriations for the building and reconstruction program are based upon a postponement of completion to 1928 and 1931, respectively. The finance authorities have insisted that the navy retrench in expenditures, and the navy insists that it can not be done without imperiling the safety of the country. In the meantime the Diet has been dissolved, and in the absence of a new Diet before March 31, 1924, the end of this fiscal year, the government will be authorized to repeat the budget for 1923. It is believed that in the absence of a Diet the finance department will authorize expenditures up to the extent of the budget for 1924, which was to be presented to the Diet at the time of its dissolution. In the event of no Diet being convened the revised 1923 budget will be authorized for 1924. The naval figures for the revised 1923 budget are—

	Yen.
Ordinary	123,000,000
Extraordinary	115,000,000

The prepared figures to have been presented to the Diet for the 1924 budget are:

	Yen.
Ordinary	126,000,000
Extraordinary	112,000,000

It is believed therefore that in the absence of a Diet the finance department will sanction expenditures as follows:

	Yen.
Ordinary	123,000,000
Extraordinary	112,000,000

The supplementary budgets which were to provide for the scrapping of ships and the reconstruction of ships will be authorized by the finance department.

The ships in active commission in the Japanese Navy are organized as follows:

First Fleet:

4 battleships.
3 light cruisers.
4 divisions of four destroyers each (two divisions have one vacancy each).
1 light cruiser as destroyer flagship.
2 divisions of three submarines each with an old cruiser and a submarine tender.

Second Fleet:

2 battle cruisers.
3 light cruisers.
4 divisions of four destroyers each with a cruiser for flagship.
1 airplane carrier.

Foreign Service Squadron:

1 cruiser and nine gunboats.

Mine Squadron:

1 cruiser and 3 mine sweepers to be attached to first fleet in May, 1924.

The aforementioned organization includes the ships in active commission. The remainder, a much greater proportion of ships, are kept in reserve commission and are organized into guard and training divisions at the various naval stations. These ships could in an emergency be put in full commission with the fleet in two weeks time.

The number of ships building, ordered to be built or authorized are:

	Building.	Ordered.	Authorized.
Cruisers	6	3	2
First-class destroyers	9	2	15
Second-class destroyers	2	0	0
Submarines	6	3	14

In spite of the recent national disaster and resultant weakening of the country's finances, Japan appears to be making all speed possible with the construction of auxiliary ships. This movement has seemed to accelerate in the last month. An excuse given for extravagant building at this time is to satisfy industrial unrest by affording employment—also to prevent the shipbuilding companies from going to the rocks financially. The strength of this argument is weakened by the fact that the majority of the tonnage ordered is placed at naval dockyards. Since September 1, 1923, building orders have been placed as follows:

Uraga Dockyard.—Destroyers *Nos. 11* and *23*.
Ishikawajima Dockyard.—Destroyers *Nos. 13* and *25*.
Kawasaki Dockyard, Kobe.—Cruisers *Kinugasa* (7,100 tons) and *Kako* (5,500 tons), Submarines *Nos. 74* and *75*.
Kawasaki Dockyard, Nagasaki.—Cruiser *Aoba* (7,100 tons).
Yokosuka Naval Station.—Cruiser *Myoko* (10,000 tons), Submarine *No. I–58* (reporter as 1,500 tons).
Kure Naval Station.—Cruiser, *Nachi* (10,000 tons), Submarine *No. 78* (reported as 1,500 tons).
Sasebo Naval Station.—Submarine *No. 77* (reported as 1,500 tons), Mine sweepers *Nos. 5* and *6*.
Maidzuru Naval Station.—Destroyer *No. 21*.

(All the above ships, however, are not yet laid down.)

The above details are given as evidence that Japan is speeding up construction of noncapital ships for reasons other than that of assistance to private shipyards.

The officer and enlisted personnel of the navy have been reduced to conform to the navy resulting from the Washington treaties. The total numbers are—

	Oct. 1, 1922.	Oct. 1, 1923.
Total commissioned officers	4, 929	4, 764
Total chief warrant and warrant officers	2, 776	2, 414
Total petty officers and men	65, 469	58, 274
Percentage of officers on shore duty	60	73
Percentage of men on shore duty	40	63

It is believed that the officers and men are well trained in their prescribed duties and may be expected to execute their duties with credit. However, it is not believed that they are supermen either physically or mentally. A very general feeling exists among foreigners here that the Japanese has been muchly overrated—his cunning, mentality, and physique are more fiction than truth. The Japanese is loyal, intensely patriotic, and has great courage when stirred by patriotic motives, but he lacks ingenuity, initiative, and resourcefulness. The emergency period of the recent earthquake revealed the psychology of the Japanese; that must be considered in the estimate of the country. Courage, judgment in emergency,

resourcefulness, initiative—all went by the board in the sudden, unexpected, unthought of, and unplanned for disaster. The disaster was overwhelming, and many failures to act promptly and properly can well be excused, but the fact remains that the Japanese weaknesses were revealed to an extraordinary degree; the Government did not function, the various departments were bound with red tape, and there was no display of initiative or authority. No effective measures in the immediate crises were taken.

The Japanese give every indication of living up to the spirit and the letter of the naval treaties. They report that the first stage of scrapping will be accomplished by the time set by the treaty.

Considerable attention is given by the Japanese to submarine and aviation activities. The 1,500-ton submarine seems to be the choice of the navy and the *F–5* seaplane and the *Mitsubishi* torpedo plane seem to be the favored aircraft. It is believed that their submarines are as good as those of any navy, but considering the numerous submarine accidents of late it is not believed that the submarine personnel are sufficiently trained for efficient operation under war conditions. Submarine and aviation duty are unpopular with the Japanese.

The opinion of foreign aviation experts on Japanese naval aviation is that a nucleus of officers composing a skeleton naval aviation organization has received very thorough training from a British aviation mission, but that since the British mission has left Japan it is doubtful if the training they gave will have a lasting effect. Since aviation duty is unpopular with Japanese naval officers, the efficiency and development of the service is likely to reflect this feeling. The principal naval aircraft manufacturing in Japan is as follows:

1. The Aicho Clocks Works at Nagoya makes the *F–5* seaplane. This machine is the Coque type with two Rolls-Royce 360-horsepower engines. The company now turns out 3 planes in one month, but can probably make 10 in one month.

2. The Yokosuka type seaplane is no longer being made. The Yokosuka works are now devoted to repair work only. About 120 of these machines have been made. Their principal use is for training.

3. The Mitsubishi Works makes single and double seater land planes for deck use. About 100 of each have been made, and the capacity of the company is about 30 of each per month. This company has made 10 triplane torpedo planes, but this type is now given up in favor of biplane torpedo planes, of which 10 have been made. The company's capacity for torpedo planes is about 6 per month.

4. Aircraft manufacturing is now being undertaken at Kure, but no estimate can yet be made of the capacity of the shops.

The 1923 naval air force as compared with the program for 1927 reported in the press is:

1923: 11½ airplane corps of eight planes each: 1 dirigible corps: 1 balloon corps.

1927: 17 airplane corps of eight planes each: 1 dirigible corps: 1 balloon corps.

The Japanese naval stations appear to be well equipped for all necessary purposes and to be run by efficient administrations. They all seem to have ample reserve stocks on hand though there is no clue as to the extent of reserve supplies.

The naval maneuvers which were scheduled for September were necessarily canceled on account of the earthquake, but extensive sea training will be given this winter and next summer, after which grand maneuvers, in which all ships and naval stations will take part, will be held in the autumn. The main problem of the maneuvers will be to defend the country against a force proceeding from the southwest.

It is not known what tactics are favored in Japanese fleet maneuvers or what employment will be assigned to the various divisions, but it is believed that all modern destroyers and light cruisers are equipped for carrying mines, and it is supposed that their use will be featured in maneuvers.

NOTE.—Most of the following data was obtained from a publication "Japan Before and After the Earthquake," published by commission of commerce and marine of the American Bankers' Association.

AREA AND DENSITY OF POPULATION.

The population of Japan is about 77,000,000 people, living in an area of about 268,330 square miles. The density of population is about 286, as compared with 35.5 in the United States.

AGRICULTURAL RESOURCES.

(*a*) Since the food stocks in the devastated regions were comparatively low and the new crops had not yet been touched, the nation's food resources were not seriously affected.

(*b*) Rice forms the principal Japanese foodstuff. The 1922 harvest, which has just about been used and which was a record crop, was 309,570,000 bushels. It is estimated that the 1923 crop will be over 300,000,000 bushels. In addition to rice, large quantities of potatoes and grain are raised.

(*c*) Silk is Japan's greatest resource. Raw silk and silk textiles constitute about half of Japan's total exports. This industry suffered very little from the earthquake.

(*d*) Lumber acreage in Japan proper is about 46,581,000, while that in Korea is 13,636,000.

(*e*) Japan has an almost complete monopoly on the camphor supply of the world.

(*f*) Fishing is one of the most important industries. The annual catch is valued at $230,000,000. The annual export is valued at about $8,000,000.

MINERAL RESOURCES.

(*a*) Japan is exceedingly poor in mineral resources. Her principal products are coal, iron, copper, petroleum, gold, silver, lead, and sulphur.

(*b*) Coal was at one time quite an item of export, but in late years it has become an item of import; 1,169,000 tons were imported in 1922. The coal production has been as follows:

January to November, 1923	tons	20,825,000
1922	do	22,221,660
1921	do	26,220,617

(*c*) In copper Japan was ranked fifth as a producing country until recent high-production costs have decreased her copper exportation to almost nothing.

(*d*) Outside of Korea, Japan has practically no iron resources. The Korean iron production of $210,000 worth in 1910 increased to $2,094,000 worth in 1920.

LABOR.

The mass of Japanese are farmers. The industrial population represents only about 5 per cent of the adults. A characteristic feature of Japanese labor is the prominent place occupied by females. Six-sevenths of the total number employed in the textile industry—the most highly developed industry in Japan—are women.

INDUSTRIAL RESOURCES.

The industrial position of Japan was little affected by the earthquake as the great manufacturing centers of Osaka and Kobe lie outside the devastated area. Shipbuilding, electrical equipment, and a small part of the textile works were the only industries damaged. In Tokyo alone 7,122 factories were destroyed, but most of them were very small, employing but a handful of men, and it is not considered that this loss affects the national industrial resources. Japan has made rapid strides in industrial advancement, but it is believed that her future development will be more complicated and less rapid.

SHIPBUILDING.

The shipbuilding boom during the war received a decided setback in the post-war depression. The number of shipyards, which had increased from 6 in 1913 to 51 in 1918, fell back to 27 in 1921. The

1922 tonnage was 59,000 tons, as compared with the 619,064 tons of 1919. The shipyards near Yokohama suffered heavily in the disaster, but several months will see them restored to normal capacity.

CHEMICAL INDUSTRY.

The future of Japan's chemical industry is much in doubt on account of the necessity of importing raw materials with the exception of sulphur, and by-products of the gas industry.

IRON AND STEEL.

The iron and steel industry has not attained any great importance. The existing plants are dependent upon Government aid, and with the exception of materials for military and naval use do not supply more than 25 per cent of the domestic requirements. The Government owns and operates the steel plant at Iwata and at Muroran, where the steel plates for the navy are made.

COMMUNICATIONS.

The communication system in Japan by telegraph and telephone is exceedingly bad. The communication department is most inefficient. Steps are now under way to establish wireless communication throughout Japan. The railways are experimenting with it.

TRANSPORTATION.

The highways are narrow, crooked, and exceedingly bad. The railroads are fair.

FOREIGN TRADE.

The unfavorable trade balance December 31, 1923, was ¥536,948,000. The 1923 imports were ¥1,983,896,000; exports were ¥1,445,948,000. The total foreign trade for 1923 decreased ¥94,000,000 as compared with 1922. The excess of imports during 1923 was greater by ¥284,000,000 than the 1922 adverse trade balance. (Statement of commercial attaché, Tokyo.)

During the first seven months of 1923 the United States took 50 per cent of Japan's exports and supplied 25 per cent of her imports.

IMPORTS.

Raw cotton forms 25 per cent in value of the total imports, and 40 per cent of this comes from the United States. Other imports are machinery, wood, construction materials, iron, and oil.

EXPORTS.

Raw silks is by far the greatest export item, and the United States takes about 90 per cent of it. The price of raw silk is regulated by the condition of the consuming market in the United States. Cotton textiles form the other large item of Japan's exports. Other exports are refined sugar, tea, knitted goods, paper, and matches.

FINANCES.

The combination of the adverse trade balance and the government's efforts to hold the yen at par have resulted in a considerable depletion of specie holdings abroad. This condition has been magnified by post-earthquake conditions, and it is expected that foreign loans will be resorted to in order to finance the reconstruction and hold the yen near par. The Japanese financial readjustment will have to take into account: (*a*) A reduction in revenues; (*b*) an increase in construction materials; (*c*) an adverse trade balance.

The national debt on December 31, 1923, was ¥3,825,100,000, of which ¥2,531,500,000 was domestic loans and ¥1,320,600,000 foreign loans. On December 31, 1923, gold specie holdings by the government were ¥526,000,000 and by the Bank of Japan were ¥127,000,000. Of this ¥208,000,000 was held in Japan and ¥445,000,000 was held abroad. It is understood that of the above holdings that ¥350,000,000 is held for payment of the principal and interest on British loans maturing in 1925, leaving only ¥95,000,000 available for release for financing import business. Since November 30, 1923, the gold held abroad decreased by ¥67,000,000. (Statement of commercial attaché, Toyko.)

POLITICAL.

The Kiyoura, or so-called "Peers cabinet," seeing the certainty of a vote of nonconfidence being passed by the Diet abruptly dissolved the Lower House January 31, 1924, before a nonconfidence resolution could be introduced. This action has enraged the members of the Lower House and has added fuel to the flames of opposition throughout the country to a bureaucratic government. The press has strongly supported the opposition. The issue is improvement in constitutional government and now goes to the country to be decided by a general election in April, 1924. The Government has the partial support of the House of Peers and the combined opposition of the Lower House with the exception of one party which split from the Seiyukai and numbers about 100 members. The total Lower House membership is 464. Considering the election possibilities the Government has the

advantage of "holding the reins," which is a very potent factor in Japanese elections—hardly ever has an election gone against the Government that has police support. Also the Government is fostering universal suffrage (the total vote now is 3,000,000), the establishment of a Department of Agriculture, and promises to speed up reconstruction. Japan is in the throes of a political reformation which has for its object a change from bureaucratic to party government.

SOCIAL CONDITIONS.

The country continues to be in a state of social unrest, and prominent business men have expressed the likelihood of an industrial uprising of very serious proportions. The present political situation is involving questions of class distinction and suffrage, and while the Government would prefer the trend of public opinion to be diverted from social conditions it is not entirely unwelcome as a means of distraction from immigration questions. It is very obvious that Japan has a great and growing fear of socialism. When these questions came up in former days, the Government submerged them in matters of national importance abroad. She is no longer in a position to do this, and it seems that the social problems will have to be squarely faced.

FOREIGN POLICIES.

The intelligent men of Japan, both in high official positions and in the leading financial and business circles, realize fully and completely that this country can not undertake war with the United States, so that question is entirely, as the phrase goes, off the boards.

That does not mean, however, that the Japanese Government will submit to anything that it deems unfair or contrary to the recognized natural or legal rights of an independent state. They can always be depended upon to present their point of view and to attempt to achieve an adjustment, by diplomatic methods, whenever there is a disagreement between Japan and the United States.

The Japanese Government regards the Washington treaties—the Naval Treaty and the Four Power Treaty on the one hand and the treaties and agreements regarding China on the other—as of incalculable value; and they will be careful not to impair these treaties or create suspicions regarding them by any deviation either from the letter or the spirit of them.

This attitude is entirely logical, for, in the first place, Japan lives by her overseas trade and not, as we, by one State selling to another; and, in the second place, by far the largest trading nation with which Japan has to do is the United States, we both selling to and purchasing from her nearly 40 per cent of her overseas trade

The foregoing applies not only to the present government in office but to any government that may follow. Any government that would take a policy contrary to this popularly and officially approved policy could not remain in office. In fact, it would not be, in the first place, appointed.

With regard to anti-Japanese legislation in the western States and Japanese exclusion laws, the Japanese Government can do nothing but protest and appeal to the American sense of justice. Of course, their amour propre will be affected and they will regard the legislation as discriminatory and unfair, but, as has always been the case, they can only accept whatever we do.

With regard to China, the policies of the Japanese Government have been very clearly demonstrated within the last two years. If the Japanese Government had any territorial designs there, they certainly would not have withdrawn troops from Hankow (where they had 500) and from Shantung (where they had 3,000) and from Siberia (where, I believe, they had 10,000 or 11,000). The militaristic policies of this country have received a serious setback. The military men are no longer in the saddle, as the saying goes, and it is impossible that they can recover the position of eminence and prestige that they held for a period of years after the Russo-Japanese War.

Only in case of a Russian invasion of the northern Provinces of China would Japanese troops be again put into that country. The principle laid down for many years in the Anglo-Japanese Alliance and in repeated notes to our own as well as to other Governments—that is to say, the principle of integrity and independence of China—is one for which Japan may be expected to wage war, *if necessary*. The United States and Great Britain though pledged likewise to this principle, have little more than moral interest in the maintenance of China's integrity; indeed, it is a question whether American and British trade would not be greatly enhanced and developed if some effective organizing force were to take control in China. But with Japan the situation is totally different. A nation like Russia advancing into China would be to Japan what an advance of the formerly potent Germany (before 1914) into Mexico would be to us.

With the United States and Great Britain giving their moral and diplomatic support to the maintenance of China's integrity and independence, Japanese officials can not fail to realize that they have backing which is worth much to them. This they are not likely to destroy by self-seeking enterprises.

Of course, this does not preclude the natural competition for trade in China, and from time to time disagreements, such as that over the radio contracts, will develop. But what advantage could

be gained in China's trade, both existing and potential, is not worth a great war either to Japan or to the United States.

With regard to Russia, it is important for Japan that working arrangements be achieved as soon as posible, so that the short quick route to Europe can be opened, so that Japanese fishing companies may have easier access to the great fisheries off the so-called Maritime Province of Russia, and so that trade and enterprise generally may be developed through the port of Vladivostok and along the Siberian and Chinese-Eastern Railway. The Japanese Government is anxious to come to terms with the Russian Government, but has hitherto been unwilling to accept the principle that treaties signed and debts incurred by former Russian Government shall be considered null and void.

CONCLUSIONS.

1. The Japanese Navy suffered heavy losses in the earthquake, but its strength was not seriously impaired. The navy is well organized, well manned, and in good condition. It may be expected to make a creditable showing in an emergency provided the nature of the emergency is not something unplanned for. There is considerable activity in the construction of noncapital ships.

2. The country has practically no natural resources necessary to industry. There is a large and evergrowing adverse trade balance. The United States is by far the greatest export and import customer of Japan. The gold holdings abroad have been considerably depleted, and Japan will be forced to float a foreign loan to finance its import trade.

3. One of the most serious political situations the country has ever faced is now being fought—the issue is a clamor of the people for an improvement in constitutional government.

4. Japan has a great and growing fear of socialism, which appears to be justified by recent events.

5. Japan has adopted a conciliatory attitude in its foreign policy and is striving to live up to the agreements of the treaties made at Washington. Japan may be expected to forcibly present its viewpoints in foreign matters, but nothing short of a serious offense to her honor will induce Japan for the present and for the immediate future to wage war.

JAPAN.

COMMENTS ON NAVAL OFFICERS.

February, 1924.

The following article appeared in the Japanese press:

Most of the work in connection with the Naval Treaty will be over about the close of the fiscal year 1923. In carrying this out what worried the department

most was not the scrapping of ships nor the weakening of the national defense, but what disposition to make of the personnel. For some time past the number of naval personnel had been gradually increased to meet the demand following the adoption of the 8–8 program. About 800 officers above the rank of lieutenant have been dropped since the treaty.

After the treaty, causing a considerable decrease in the number of ship and men, there came the disastrous earthquake and fires of September 1, 1923, which also did serious damage to the navy and caused a further decrease in naval expenditures. In spite of the activities of the United States in increasing her air forces and ships below the first line and England's establishment of a powerful base in Singapore, our navy's hands are tied.

The last couple of years have indeed been hoodoo years for our navy. The two big men of our navy, Shimamura and Kato, both passed away while our navy was passing through its hardest years. The world-famed Togo is still here, but he is now to be considered at a national treasure of the past. Who are the men who will shoulder the task of rebuilding our navy, which is now shrunk, spiritually and physically, through adverse circumstances? Who will take the places of Shimamura and Kato? No doubt there are a lot of bright and able men in the navy, but the popular motto so often quoted since the earthquake "spiritual revival" is not to be applied to the general public only, but to the navy more fittingly. The many accidents to submarines can not be passed off as unavoidable accidents.

Thus the object of this article is to review what the limitation has brought about and to make a survey of the high ranking officers now remaining, for we take it, they are here by reason of the survival of the fittest.

Prior to the limitation there were 14 or 15 admirals including Gensui, Togo, and Inouye, but now there are only 6 left:

Yamashita (chief of general staff)	Seventh class.
Murakami (war councillor)	Eighth class.
Nomaguchi (Yokosuka)	Tenth class.
Suzuki (Kure)	Eleventh class.
Takarabe (minister)	Twelfth class.
Takeshita (first fleet)	Do.

Speaking of their nativity, Yamashita is from Yamagata Prefecture, Murakami from Saga, Nomaguchi, Takarabe, and Takeshita from Satsuma, and Suzuki from Chiba.

Due to the traditional power of the Satsuma men in the navy, three of them are still in the list above, but Nomaguchi and Takeshita are no longer men of to-day nor representative figures of Satsuma. Murakami, favored by Takarabe, was saved from the waiting list when his classmate Tochinai was dropped. Only three—Yamashita, Suzuki, and Takarabe—are likely to become gensui.

Yamashita and Takarabe during the Russo-Japanese War served as staff officers at the supreme military headquarters, while Suzuki served in the first line and made fame in torpedo warfare. It is undisputable that both Yamashita and Suzuki enjoy the highest regards among navy men, possessing the personal character of the highest degree. These two men, even though they may lack the wisdom of Kato and the tact of Takarabe, are the most indispensable men to control and help the navy to undergo the spiritual revival.

When Takarabe dropped Tochinai last December, saving Murakami, Tochinai is said to have not taken the matter so graciously, and this led to lengthy and oft-repeated conferences between the two. The young officers in

the department, taking note of it, whispered among themselves that Takarabe had begun to resort to his characteristic play. However, Takarabe, mindful of the trend of the time, is said to be comparatively fair in dealing in personnel matters. When the spirit of the navy is dull, as it is to-day, such a man is indispensable to serve as a "supporting pillar."

The number of twelfth class graduates, which includes Takarabe, was nine previous to the naval limitation treaty, but there are now only Takarabe, Takeshita, and Okada. Oguri and Nakano were the last to be sacrificed. Okada with Ide, the last vice minister, is expected to become admiral in April. He became vice minister after leaving the bureau of matériel and worked hard during that time, and he will be rewarded as above and be given the command of the first fleet in April, succeeding Takeshita. He is noted for industriousness.

Of the thirteenth class, Ide is the only one remaining. While carrying out in connection with the limitation he made enemies—with those who were sacrificed—but when it comes to working there are few his equal in the department. He is on a furlough now, but when he returns he is quite certain of being assigned to a naval station as commander in chief.

Of the fourteenth class, which includes Yamaji and Moriyama, only two remain—Horiuchi, vice chief of general staff, and Saito, of Sasebo.

The fifteenth class numbered eight, with H. Kato, of the second fleet, Sato, Shimomura, Matsuura, and Yoshioka, and others, but now there are only two remaining, H. Kato and Abo, of bureau of matériel. A strong man among the new element in the navy and one who will strengthen the navy in the coming days is Kato. When the great earthquake occurred, he was off the coast of Chosen, but on hearing of it he immediately collected supplies around there and with 20 knots speed brought his fleet to Shinagawa. To him, such things as seniority, etc., did not amount to very much. He, however, bowed to Yamashita. Among many officers in the navy he was the only man who dared to speak what he thought of in front of the late Kato, and there was good reason why the latter took him along when he went to attend the Washington Conference. He is rather quarrelsome and often beat a fellow when intoxicated, and when arguing he would squeeze the other fellow's hand and not let go until his opponent yielded. Thus most everybody avoided him when he was in a bad humor.

The sixteenth class, to which Hyakutake and Taniguchi belong, used to be eight in number, but is reduced to three.

In the seventeenth class there is Saito (commander in chief, training squadron), who is noted as a tactician and a model warrior of the highest character. In these days of decline in naval spirit he is the very man we should reserve as successor to Yamashita or Suzuki. Nakazato, too, is highly regarded as an able man as chief of bureau of supplies.

The eighteenth class, to which Furukawa (chief of education bureau) belongs, used to number 11, now is only 4.

The nineteenth class, with Yoshikawa, of Kure Yard, and the twentieth class with Matsumura (commanding fifth division), Otani (president torpedo school), show considerable decrease.

The twenty-first class, with Yamamoto (president naval college), Osumi (commanding third division), and others, is holding out somewhat better. With the exception of the class head, Tsukuda, such men as Oishi (commanding *Ominato*), Shirane, and others are still on the list. Of these the career of Osumi is best, recently leaving the chair of chief of military affairs he went to sea, but no doubt will be back in the department and assume an important post.

The twenty-second class, with Yamanashi (chief of personnel) and Tosu (head of first section of general staff), used to number 11, which is now reduced to 4. Yamanashi, while not of large caliber, is a handy man wherever taken.

The twenty-third class used to number 23, but now is reduced to 6. The class is notable with the inclusion of Nomura (commanding China fleet) and Kobayashi (chief of bureau of military affairs). Nomura is a man of big caliber, and it is a pity to confine him in the navy. Kobayashi is also an able man. He is from Hiroshima, and is said to be a nephew of the late Admiral Kato; the latter used to call the other by his given name. Our navy of seven or eight years hence will be ruled by Osumi, Nomura, and Kobayashi, but as yet there is something in them that needs the finishing touch.

The twenty-fourth class, containing those who were just made rear admirals, headed by R. Nakamura (commanding first destroyer division), used to number 23, but there are now about 10. Teraoka (chief of staff, Yokosuka), Furukawa (chief of staff, Sasebo), Kanesaka (president gunnery school), Murakoshi (head of executive section, bureau of matériel), Seki, (head of second section, general staff), and Suyetsugo (commanding first submarine division) all have a very good future.

Line officers.

	At present.	Formerly.
Admirals	6	14
Vice admirals	15	28
Rear admirals	30	38

JAPAN.

ISHIKAWAJIMA DOCKYARD.

February, 1924.

On February 1, 1924, Ishikawajima dockyard, in the suburbs of Tokyo, was inspected. This yard was very severely damaged by fire. The authorities state that the estimated loss was about 5,000,000 yen, that the yard was reduced to about one-half capacity, that it will be restored to its former condition, and will attain normal capacity by the end of April, 1924.

Before the earthquake about 2,500 men were employed. At present there are 1,000 men, and difficulty is experienced in obtaining more labor due to the fact that there are no houses near by that are available for the workmen.

In addition to building ships this yard also manufactures bridge material and automobiles, both passenger and truck.

The dry dock was not damaged. Effort was made to obtain dimensional and geological data on this dry dock, but due to the fact that all papers and records were burned none could be obtained. The floor of the dock, I was told, rests on piles. The sides of the dock are formed of wooden piles. They appear to have been bulged a little by the earthquake.

Destroyer *No. 12* was in dry dock at the time of the earthquake and was not damaged.

The building ways are undamaged.

In addition to destroyer *No. 12* the other ships building here are *Nos. 13* and *25*—both laid since the earthquake. No other ships are building or have been ordered.

This yard builds the Zölly type turbine. The license for building this turbine was obtained several years ago from the Escherwyss Co. of Zurich, Switzerland.

In conversation with the naval inspector, an engineer commander, I. J. N., and engineers of the dockyard I obtained the following information:

1. Destroyer *No. 12* will be completed about May, 1924.
2. Destroyer *No. 13* was laid down in November, 1923.
3. Destroyer *No. 25* was laid down in January, 1924.
4. The completion of these boats will not be delayed by consequence of the earthquake.
5. Destroyer *No. 7* will be completed at Maidzuru about March 1, 1924.
6. Destroyer *No. 9* will be launched at Maidzuru about April, 1924, and be completed about July, 1924.
7. Destroyer *No. 21* has been ordered to be built at Maidzuru.
8. Submarine *No. 44* is a 1,500-ton boat with four engines.
9. The fuel-oil heaters installed on destroyers are satisfactory. They are manufactured at Mitsubishi, Nagasaki. They are coil types, with steam surrounding the coils.
10. The oil-burning practise is to heat the oil to about 180° F. at a pressure 150 pounds. The burner used is similar to the Kermood-type mechanical burner. Steam turbines of the sirroc multiple-blade type blowers are used in the firerooms, and a fireroom air pressure of from 5 to 6 inches is maintained.
11. Weir duplex air pumps manufactured at Mitsubishi, Nagasaki, are used. A vacuum of 28 inches is maintained.
12. The Sharpless oil purifier is used with satisfaction. It is purchased in New York City from the Takamine Co.
13. The "SAL" submerged log is installed on destroyers and cruisers and is satisfactory. (This information was obtained from an engineer officer who is not very familiar with logs.)
14. In general, Monel metal and nickel steel are used in turbine blading. Stainless steel for this purpose is under experiment at Kure.
15. The Zölly type turbine (horsepower unknown) is installed in destroyers building at Ishikawajima. The blading of this turbine is professed to be very rugged: it is 5 per cent nickel and 95 per

cent forged steel. The blade shrouding is the same. The disk is forged steel. The water rate of the turbine is 9½ to 10 pounds per brake horsepower per hour. The reduction gear is a double helical gear immersed in oil. This yard obtained the building license for this gear from the Clark-Chapman Co., Newcastle-on-Tyne, England.

16. I asked if the destroyers built at Ishikawajima were fitted for mines, and the naval inspector said that they were equipped after commissioning.

As evidenced by the fact that this yard is completing one destroyer and has laid two since the earthquake, it can not be said that naval interests have suffered here by the earthquake.

JAPAN.

JAPANESE NAVAL AVIATION.

February, 1924.

There is given herewith a digest of the information at present available upon certain features of Japanese naval aviation. The sources of information are various, and it has not been possible to absolutely confirm a good deal of what follows.

The Japanese Navy has a more or less definite policy in regard to naval aviation. This policy is almost parallel to that of our Navy. Certain conditions have impeded development, the most important of these being—

(*a*) Racial characteristics.
(*b*) Lack of a well-trained nucleus personnel.
(*c*) Lack of an aircraft industry.
(*d*) Intolerant attitude of older naval officers.
(*e*) Existing regulations regarding sea duty, promotion, etc.

The average Japanese naval officer and enlisted man is not regarded as flying material at all comparable with corresponding personnel in the navies of the other principal powers, in so far as the development of all-around well-balanced pilots and mechanics is concerned. It appears that here, as is the case in many other respects, the Japanese does not thoroughly understand: it is difficult for his mind to take in the essential differences between the theoretical and the practical. His groundwork is, in general, good, and many of them are diligent and apt in absorbing instruction up to the point when it becomes necessary to "solo."

The number of Japanese officers having a thorough knowledge of aviation is very limited, and due to the regulations regarding sea duties, etc., this limited number is being constantly drawn upon for duties outside aviation. Changes are so frequent it is almost

impossible to build up an organization anywhere in Japanese aviation which is not almost immediately upset by the detachment of important officers and the sending of these officers to what appears in many instances to be unimportant duties.

There is practically no civilian aircraft industry in Japan. The Government has undertaken to build up a Government industry and the result is just being felt. The result in the opposite way works that no civilian aircraft manufacturing industry can live so long as the Government factories are maintained. It is stated that the Japanese authorities appreciate this situation, but that under the circumstances they are justified in the establishment of Government factories. There appears some justification for this decision.

The same spirit of intolerance as existed in the early days of aviation among the older officers in other navies appears to still exist among the older officers of the Japanese Navy.

The Japanese are apparently having the same trouble with regard to the questions of sea duty for officers in aviation as we have experienced in our Navy. As they have only one real ship assigned to aviation duties, they have not the advantages which exist for us in the way of assignment of aviation officers to sea duty on ships of air squadrons, thereby keeping them in touch with aviation.

It appears that in so far as the navy is concerned, there is ample money available for aviation. In fact, to some there appears to be a large amount of wastefulness and extravagance. This may be attributed to excess zeal and ignorance on the part of those responsible for the provision of aircraft and aircraft equipment.

The present aircraft equipment represents the most heterogeneous assortment of airplanes, seaplanes, and amphibians. These for the most part have been obtained from England, but some few have come from Germany, and a considerable number have been constructed in the Mitsubishi Works.

Great efforts are being made to be self-supporting in so far as planes are concerned. The Mitsubishi factory is described as being a very fine plant of a considerable capacity. There has also been built a plant in the dockyards at Kure, which plant is being used at the present time for the manufacture of Avro-type training planes. There is under construction a branch of the Mitsubishi factory at Sasebo. The Japanese are utilizing the services of an Englishman formerly of the Sopwith Co. as a designer, and are endeavoring to bring out new types. They have brought out so far a single-seater fighter equipped with a 300-horsepower Hispano Suiza engine. This is described as being a very good fighting plane with an average performance. Exact figures as to performance can not be obtained. There has been designed a torpedo plane, of which 20 were built in the Mitsubishi works. This torpedo plane is a single-seater tri-

plane equipped with a Napier Lion engine. It gave an average performance, but on account of being a triplane is rather unhandy as regards storage aboard ship, and furthermore it is very bad for deck landings, as it has a great tendency to float. This latter condition was improved somewhat by clipping the wings. It is said to have a capacity for less than 200 miles of flight when carrying a torpedo. They are now engaged in the design of a new torpedo plane which appears to be somewhat similar to the Blackburn "Dart." This plane is also to be a single-seater.

The Mitsubishi works has also produced a two-place reconnaissance plane. This plane has a 300-horsepower Hispano Suiza. Its performance was not satisfactory, and it also had floating tendencies. In spite of this a considerable number (said to be about 50) of this type were constructed. This particular thing appears to be one of the examples of Japanese wastefulness, as most of the planes were put in storage upon completion and have remained there ever since. This type has been used as a spotting plane, but a new spotting plane equipped with a Napier Lion engine is being manufactured. It is thought to be only a two-seater.

The Mitsubishi factory is constructing F–5 type seaplanes equipped with the Japanese version of the Rolls-Royce Eagle. These planes are said to be fairly good copies. This does not apply to the engine, which will be dealt with hereafter.

The Japanese have not had very great success in the building of engines. No engines of Japanese design have been of any use. They have made several efforts to copy foreign types, in some cases upon the payment for manufacturing rights, and the acquirement of complete plans; in other cases upon endeavoring to pirate the design by an examination of the engine. They have made a fairly successful copy of the German 100-horsepower Benz, this it is believed from plans obtained from the Germans. Their efforts in regard to the Lorraine-Dietrich have been disastrous. They paid a large sum for the plans and manufacturing rights of an engine which was not regarded in Europe, outside of France, as being very good. The Japanese copy was far worse, and its construction has been abandoned.

They also purchased the manufacturing rights and plans of the 300 horsepower Hispano Suiza, and their copies of this engine have been very satisfactory, although, as is well known, the design itself is none too good. They have built in the Mitsubishi Works an engine which they call their own, but which is a very close copy of the Rolls Royce Eagle. This engine is only fairly satisfactory, but the copy is said to embody so many of the Rolls Royce features that steps are being taken by the Rolls Royce Co. to obtain the payment of royalties.

Before leaving the general subject of planes and engines, it might be desirable to record some opinions in regard to Japanese workmanship on aircraft and engines. The individual workmanship seems rather bad, with the result that the output is far below what might be expected from the equipment of the plant and the number of men employed. Furthermore, the Japanese appear singularly oblivious to the necessity of the detailed care and attention required to be given to planes once they are completed and in service, and this particularly applies to engines.

The Japanese are copying several of the British type of bombs, but they do not admit this fact. The copies are very good, especially in the case of the smoke bomb.

The Japanese are using a modified type of their 5 m. regular service torpedo for aircraft work. They have had great difficulty with this torpedo and further modifications are being carried on. Most of the difficulty seems due to methods of dropping rather than to the torpedo itself.

Training is conducted upon somewhat the same general system as that used in our naval aviation except that the bulk of preliminary flying training is done on land planes. Officers and especially qualified enlisted men are selected annually and sent to Kasumiga-ura Training School. This school combines ground and flight training. The exact length of the course is not fixed, but the average time of completion is about one year. This time seems excessive, especially since no advanced training is done during this period. It is due both to the rather imperfectly organized system and to the fact that the average Japanese is not a good aviation student. The ground-school training is carried along throughout the entire period. This ground-school training appears poorly conducted.

Upon completion of the course at the preliminary training school the student goes to further training either at Yokosuka or Sasebo. The activities at Yokosuka are principally confined to seaplanes, although a land field has been constructed at that place and is used for a limited amount of flying of spotting and reconnoissance types. This land field is said to be almost entirely artificial, having been built by grading down a hill. The result is that it is very uneven and is stated to be dangerous for any planes except those equipped with Oleo shock absorbers.

Very few details of the advanced training are known, but it appears to include big boat flying, air navigation, torpedo launching, a small amount of spotting, gunnery, formation flying, and a small amount of combat work. By the process of elimination it is concluded that the gunnery, formation flying, and combat work is done at Sasebo, but this is not vouched for.

The last class taken in for flying training consisted of 50 officers and 50 enlisted men.

No very extensive operations have been carried out. The use of aircraft in connection with the fleet was planned on a large scale in conjunction with some late autumn fleet operations, but this plan was completely upset by the earthquake.

The Japanese have given a certain amount of study to the tactics of airplane torpedo attack and of laying smoke screens by airplanes, but it is gathered that this has been done on a very small scale. They have also used planes for spotting gunfire during target practices, but this does not yet appear to be what might be called a regular feature. They have done a limited amount of scouting with big boats. The only extended flights carried out in these boats appear to have been one around the southern part of Japan, which was led by an English officer, and one around the northern part of Japan, which ended rather disastrously.

The *Hosho* is the only proper aircraft carrier at present in commission, and some details concerning her follow:

The arresting gear consists of fore and aft wires spaced 6 inches apart and held 10 inches from the deck by a series of fiddle bridges. These fore and aft wires are rigidly secured at each end, but arrangements exist for the adjustment of the wires between landings. The fiddle bridges are in sections, each section supporting about six wires. There are three funnels, all on the starboard side, and slight recesses are made on the flying-on deck, so that when the funnels are swung up to the perpendicular about one-half of each funnel comes inside of the edge of the flying-on deck. The funnels hinge outward to a horizontal position, and under normal conditions there appears no trouble from smokepipe gases. The island, which is located on the starboard side just forward of the funnels, appears to be a stream-line deck house about 20 feet in height upon the top of which is placed a rather short and fairly light tripod mast with a very short signal or wireless yardarm. There is also a wireless mast located some distance abaft the after funnel, and this hinges outward to an extent apparently corresponding to the funnels. The landing wires extend well forward up to a position almost abreast the second funnel. The usual ramp arrangement of the deck exists at the forward ends of the wires.

The single-seater fighter which is used with the *Hosho* is of the single-bay type with diagonal half struts extending up from each side of the fuselage to the top plane. The wing struts appear to be vertical—that is to say, they are not inclined outward.

The fuselage has an elliptical form forward, growing out into a rectangular form aft. It does not appear to be a very good design as far as resistance is concerned, but it may have the merit of giv-

ing good vision for deck landings, the pilot's position being rather high. Its top speed is about 140 miles an hour. There exists a modification of this plane in which the carbureter and manifold arrangements of the engine have been so changed that it is possible to give a deep Y between the cylinders into the forward part of the fuselage, thus giving the pilot good vision ahead. There are five sets of double hooks on the main axle between the wheels, and under the tail is located a horizontal bar extending athwartship which carries four double landing hooks. This bar is located about 10 inches below the bottom of the fuselage just forward of the tail and has diagonal braces extending up from each end of the fuselage. These tail hooks are to keep the plane from swerving after engaging. No special strength is put in the tail except locally to take up the strain from the tail hooks, these hooks being attached in such a way they will pull out before the strain becomes great enough to fracture the longerons. All of the hooks are fitted with a kind of gate which closes immediately upon seizing one wire, thereby preventing additional wires from being picked up. The Japanese have done very little deck flying and only their very best pilots are qualified for this work.

JAPAN.

LIST OF NAVAL VESSELS.

February, 1924.

The following detailed list of Japanese naval vessels was received from Japanese Navy Department as of September 1, 1923, and is corrected by this office to February 1, 1924:

Battleships: *Fuso, Yamashiro, Ise, Hyuga, Nagato, Mutsu.*

Battle cruisers: *Kongo, Hiyei, Haruna, Kirishima.*

First-class cruisers: *Kako* (5,550), building at Kawasaki, Kobe; *Furutaka* (7,100), building at Mitsubishi, Nagasaki; *Kinugasa* (7,100), building at Kawasaki, Kobe; *Aoba* (7,100), ordered at Mitsubishi, Nagasaki; *Myoko* (10,000), ordered at Yokosuka; *Nachi* (10,000), ordered at Kure; *No. 7* (10,000), authorized, but not ordered; *No. 8* (10,000), authorized, but not ordered.

Second-class cruisers: *Tone, Chikuma, Hirato, Yahagi, Tenryu, Tatsuta, Kuma, Tama, Kitagami, Oi, Kiso, Nagara, Isuzu, Natori, Yura, Kinu; Abukuma* (5,570), launced March, 1923, at Uraga; *Naka* (5,570), laid June, 1922 (destroyed by earthquake), Yokosuka Dock; *Sendai* (5,570), laid February, 1922, at Mitsubishi, Nagasaki; *Jintsu* (5,595), laid August, 1922, at Kawasaki, Kobe; *Yubari* (3,100), completed July, 1923, at Sasebo.

Aeroplane carriers: *Wakamiya, Hosho; Kaga*, building at Yokosuka; *Akagi*, building at Kure.

First-class destroyers: *Umikaze, Yamakaze, Urakaze, Isokaze, Hamakaze, Amatsukaze, Tokitsukaze, Kawakaze, Tanikaze, Minemaze, Sawakaze, Oki-*

kaze, Shimakaze, Nadakaze, Yakaze, Hakaze, Shiokaze, Akikaze, Yukaze, Tachikaze, Hokaze, Nokaze, Namikaze, Numakaze, No. 1, No. 3, No. 5; No. 7, laid December, 1922, at Maidzuru; *No. 9,* laid July, 1923, at Maidzuru; *No. 11,* laid March, 1923, at Uraga Dock; *No. 13,* laid November 1923, at Ishikawajima; *No. 15,* laid March, 1923, at Fujinagata, Osaka; *No. 17,* laid September, 1923, at Sasebo; *No. 19,* Sasebo; *No. 21,* ordered ———, Maidzuru; *No. 23,* laid in January, 1924, at Uraga; *No. 25,* laid in 1923 at Ishikawajima; *No. 27,* not laid, Fujinagata, Osaka. The following are authorized but not ordered: *Nos. 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44.* (Destroyers numbered from *30* to *44* are only temporary numbers.) Of the total of 53 first-class destroyers 26 are uncompleted.

Second-class destroyers: *Sakura, Tachibana, Kaba, Sakaki, Kayede, Katsura, Ume, Kusunoki, Kashiwa, Hatsu, Sugi, Kiri, Momo, Kashi, Hinoki, Yanagi, Nara, Kuwa, Tsubaki, Maki, Keyaki, Enoki, Momi, Kaya, Nire, Kuri, Nashi, Take, Kaki, Toga, Kiku Aoi, Hagi, Susuki, Fuji, Tsuta, Ashi, Hishi, Hasu, Sumire, Yomogi, Warabi, No. 2, No. 4, Tade; No. 6,* launched February, 1923, at Uraga; *No. 8,* launched September, 1923, at Uraga; *No. 10,* launched November, 1922, at Ishikawajima; *No. 12,* launched April, 1923, at Ishikawajima; *No. 16* and *No. 18,* both completed. (*Nos. 6, 10, 16,* and *18* are completed.) Total of 51 second-class destroyers, of which 2 are uncompleted.

Third-class destroyers: *Fubuki, Yayoi, Hatsuyuki, Oikaze, Matsukaze, Kikuzuki, Ariake, Yenohi, Yugure, Hibiki, Hatsuharu, Uranami, Arare, Kisaragi, Shiratsuyu, Mikazuki, Udzuki, Isonami, Ushio, Wakaba, Shigure, Nowake, Hayate, Ayanami, Kamikaze, Asakaze, Yudachi, Minadzuki, Nagatsuki, Hatsushimo, Harukaze, Shirayuki, Yuugai.* Total, 33.

Mine sweepers: *Nos. 1, 2, 3; No. 4,* building at Sasebo; *Nos. 5* and *6,* to be built at Sasebo; total of six, three of which are uncompleted.

Submarine tenders: *Karasaki, Komabashi, Jingei; Chogei,* launched September, 1923, at Mitsubishi, Nagasaki. Total of four, one of which is uncompleted.

Mine layers: *Aso, Katsuriki.* Total of two.

First-class coast-defense ships: *Asama, Idzuma, Kasuga, Tokiwa, Idzumo, Nisshin, Yakumo, Iwate.* Total of eight.

Second-class coast defense ships: *Manshu, Chitose, Akashi, Tsushima.* Total of four.

First-class gunboats: *Chihaya, Mogami, Yodo, Ataka.* Total of four.

Second-class gunboats: *Uji, Toba, Seta, Sumida, Saga, Katata, Fushimi, Hira, Hotsu.* Total of nine, all completed.

Submarines:

No.	Class.	Where built.	Date of launching.
HA–1	Third	England	May, 1908.
HA–2	do	do	Do.
HA–3	do	Kure	March, 1911.
HA–4	do	do	Do.
HA–5	do	do	Do.
HA–6	do	Kawasaki, Kobe	July, 1912.
HA–7	do	Kure	March, 1916.
HA–8	do	do	Do.
HA–10	do	France	April, 1914.
14	do	Kure	July, 1918.
18	Second	Kawasaki, Kobe	July, 1919.
19	do	Kure	October, 1917.
20	do	do	December, 1917.

No.	Class.	Where built.	Date of launching.
21	Second	Kawasaki, Kobe	November, 1919.
22	do	Kure	March, 1919.
23	do	do	August, 1919.
24	do	do	October, 1920.
25	do	Mitsubishi, Kobe	October, 1919.
26	do	do	March, 1920.
27	do	do	July, 1920.
28	do	do	November, 1920.
29	do	do	February, 1921.
30	do	do	May, 1921.
31	do	Kawasaki, Kobe	March, 1921.
32	do	do	June, 1921.
33	do	do	September, 1921.
34	Class not shown	Kure	February, 1921.
35	do	do	March, 1921.
36	do	do	December, 1920.
37	do	do	April, 1921.
38	do	Yokosuka	October, 1920.
39	do	do	Do.
40	do	do	October, 1921.
41	do	do	Do.
42	do	Sasebo	December, 1919.
43	do	do	July, 1920.
44	Building	Kure	November, 1921.
45	Class not shown	Sasebo	October, 1921.
46	do	Mitsubishi, Kobe	December, 1921.
47	do	do	March, 1922.
51	Building	Kure	June, 1922.
57	Class not shown	Mitsubishi, Kobe	Do.
58	Building	Yokosuka	July, 1922.
59	Class not shown	Mitsubishi, Kobe	December, 1922.
62	do	Sasebo	April, 1922.
68	do	Kawasaki, Kobe	December, 1922.
69	do	do	January, 1923.
70	Building	do	February, 1923.
71	do	do	March, 1923.
72	do	Mitsubishi, Kobe	May, 1923.
73	do	do	September, 1923.
74	do	Kawasaki, Kobe	(?)
75	do	do	(?)
I-58	Ordered	Yokosuka	
77	do	Sasebo	
78	do	Kure	

Special-service ships: Training special service ships, *Asahi*, *Shikishima*, *Fuji*, target-towing ship, *Settsu*; surveying ships, *Musashi*, *Yamato*, *Matsuye*, *Koshu*; repair ships, *Kwanto*; carriers (oil), *Tsurugizaki*, *Susaki*, *Noma*, *Notoro*, *Shiretoko*, *Erimo*, *Sata*, *Tsurumi*, *Shiriya*, *Iro*, *Kamoi*, *Ondo*, *Hayatomo*, *Naruto*; carriers (coal), *Takasaki*, *Seito*, *Muroto*, *Nojima*; ice crusher, *Otomari*; supply ship, *Mamiya*.

JAPAN.

NAVAL NOTES.

January–February, 1924.

From Japanese Press.

The first grand maneuvers since the Washington treaty was signed will be held the latter part of September, 1924, with the coast of Kyushu as the center of activity.

The operations are to be on a larger scale than ever before attempted and the following will participate:

First and second reserve vessels attached to the three principal naval stations.

Land organizations attached to navy yards, hospitals, defense corps, signal stations, etc.

Vessels attached to Maidzuru, Bako, Chinkai, and minor naval stations.

All of the vessels attached to the combined fleet, a total of about 100 ships.

The latest type submarines, mine sweepers, airplane carrier *Hosho*, mine layers *Tokiwa* and *Aso*, *Astra No. 2* and *S-S* dirigibles, and about 100 airplanes of different types attached to the various flying corps will also participate.

The object of the maneuver is to defend the country against an attacking enemy approaching from the direction of a certain archipelago in the South Pacific: the defending forces, with its base in Tokyo-wan, will meet the enemy off the coast of Southern Kyushu.

During the third stage of the maneuvers the *Aki* and *Satsuma*, now at Yokosuka, will be taken out to sea and will be used as targets by the ships and then bombed by airplanes.

The Prince Regent will act as supreme inspector, and the appointment of commanding officers, judges, etc., will be announced the middle part of September.

After the maneuvers are finished, the ships participating are expected to assemble in Tokyo Bay for the naval review.

The airplane carrier *Hosho* will leave Yokosuka early in March for Omura Naval Aviation Station, engaging in practice in airplanes taking off and alighting while under way. On the way to Omura she will stop in Hiroshima-wan, where the first practices will be held. From Hiroshima-wan part of the airplanes will fly to Omura. On the return trip she will make only one stop, and while cruising in the open sea more practices in deck flying will be held.

This is the first time the *Hosho* has gone on a long cruise and also the first deck-flying practices made in the open sea while under way.

The *Hosho* will join the first fleet in April.

The first naval long-distance flight between Kyushu and Formosa since 1921 will be held in April along the following route: Sasebo–Oshima–Okinawa–Keelung–Pescadores Isles–Mako–Takao, a stretch of 2,500 miles.

Two airplanes of the F type, with the following dimensions and with a speed of 85 miles an hour, will be used: Length of wings, 103 feet; length, 40 feet; height, 25 feet 700 horsepower.

Each airplane has accommodating capacity for 20 persons, but in this particular flight the number will be limited to seven.

The return flight will be made to Sasebo via Takao, Keelung (omitting Mako), Okinawa, and Oshima.

A successful trial flight of seaplane *F No. 2*, mounted with two 400-horsepower motors constructed at the Kure Naval Arsenal, was made on January 23. The motors were the first of the kind made by the Japanese naval workshops.

The attacking planes carried on board ships of the Japanese Navy have heretofore been of triple wings, but according to a statement, on account of the large size they are difficult to handle, especially when leaving or lighting on deck and also in stowing them on board ship, the navy has now decided to use biplanes for this purpose.

The improvement in the 1921 type machine is being made by the Mitsubishi Aeroplane Works, changing them to biplanes and to carry 450-horsepower Napier Lion motor.

The Japanese Navy Department, recognizing the importance of torpedo planes, the department of matériel has worked out a plan for an ideal torpedo plane constructed by the Mitsubishi Aeroplane Works in Nagoya. It has recently been completed and is being assembled at Kasumigaura, and trial flights are to be made this month by the English expert, Mr. Ben, employed by the company.

The special features of this plane are:

(*a*) In order to attain the highest state of efficiency in attacking an enemy, it has been made a double-seater, aiming at proper division of work between the pilot and the attacking man.

(*b*) It is equipped with Lewis machine gun.

(*c*) The front section is constructed different from the old type. The pilot's seat has been moved as far forward as possible, thus allowing the men to go to their seats from the top of the wing.

(*d*) Use of Lanbran (?) radiator.

(*e*) Widening of visional are forward.

The mounting of machine guns in torpedo planes has not yet been tried even in the United States and Europe.

The torpedo plane is equipped with a 450-horsepower motor of Napier lion type; length of wing, about 40 feet; length of plane, about 20 feet; height, about 11 feet.

The testing of a new machine gun for airplanes which were being constructed experimentally since last year will take place February 15 and 16 at the Army Aviation School, Akenogahara, Province of Ise.

No details of this have been obtained.

Bomb-dropping practice with the *Iwami* as a target will be held the early part of May, 1924. The *Iwami* will be towed from Kure to Yokosuka early in April.

The plane to be used for the bombing will be sent from Kasumigaura and will be a bombing triplane model; the bombs to be dropped will weigh about 2,000 pounds.

No further details of this have been obtained. It is learned that 2,000 pounds is the heaviest bomb in use by Japanese aircraft.

The Mitsubishi Dockyard Co. has been working on the construction of "Hispano" 300-horsepower engine since last year, while the Kawasaki Dock Co. has been working on the construction of the "Salmson" 270 horsepower, but both yards have not yet succeeded in turning them out.

The navy has also been studying the construction of this class of engine since 1921, with the French Loraine 400-horsepower as a model, and this has recently been successfully completed.

Submarine *No. 84* was launched at Mitsubishi Dockyard, Kobe, in January, 1924.

Submarine *No. 44* has failed to come up to expectations. She was launched at Kure in the spring of 1922, and was to be completed by March, 1923, but due to delays she was only recently completed and has been undergoing various trials.

Submarine *No. 44* is a new model, having four engines and four propellers, and it was expected thus to increase speed. This, however, has failed; she has failed to attain the expected result and otherwise being undesirable, the Navy Department has decided to tie her up in Kure as a reserve boat and also to use her as an experimental subject. They have given up building boats of the *No. 44* type in the future.

No further information on the above has been obtained, except that a high ranking Japanese naval officer stated that four engines were installed in the *No. 44*.

The keels of destroyers *No. 11* and *No. 23* were laid at Uraga Dockyard March, 1923, and January 24, 1924, respectively.

The keel of the light cruiser *Kinuagasa* was laid January 25, 1924, at the Kawasaki Dockyards, Kobe.

The special-service ship *Notoro* will go into dry dock at Kure the latter part of March for the purpose of changing boilers.

The *Notoro* is a 15,000-ton ship built by Kawasaki Dockyard, Kobe, and her showing is very disappointing.

According to the story of one of the officers on board, while returning to Yokosuka from Bako in January she was only able to make 3 or 4 knots an hour.

This condition is not confined to special-service ships only, but there are similar cases in other types of ships, and it is a grave matter for the navy. It is not entirely the fault of the private dockyard companies, but the equipment officers, due to their eagerness to complete the ship on schedule time, overlook deficiencies which invariably show up when the ship is put to a practical test. It is said that the navy will hereafter be more careful in selecting equipment officers.

The *Notoro* is an oil tanker of 15,400 tons displacement.

The Minister of Marine announced the call for students and training course students to be admitted to naval schools during the fiscal year 1924, as follows: Gunnery school, 1,140; torpedo school, 1,200; submarine school, 480; engineering school, 1,670; paymasters' school, 170; training students for seamanship, 170; training students for signaling, 585; training students for nursing, 200; training students for band, 15.

The students are officers; the training course students are enlisted men. It is not known how many of each are included in the above.

Since the destruction of the naval engineering school by earthquake and fire, the navy department has been contemplating the combining of the naval academy and the engineering school into

one. It has now been decided to carry this out, beginning with the new term in April.

According to the plan the engineering school will be moved to the naval academy at Kure, and both schools placed under the same president, each school, however, to have separate department head, who will be selected from the rank of rear admiral or captain.

The naval academy was prepared to accommodate cadets necessary for the 8–8 program, but now since the reduction in the navy the facilities at the academy are large enough to accommodate the present number of cadets and also the engineering students.

The *Aki* and *Satsuma* will be experimented with in order to test the effectiveness of the 16-inch guns on the battleships. These experiments are to be conducted off Tokyo-wan the latter part of February.

The *Aki* and *Satsuma* will be subjected to long and short distance firing from the 16-inch guns of the battleships, and torpedoes from destroyers will also be tested as to their effectiveness. The *Aki* and *Satsuma* are equipped with 12-inch armor plates.

This information has not been confirmed, but it is thought probable that the date of this experiment will be in the autumn of 1924, during or after the grand maneuvers.

The alterations to the battle cruiser *Haruna* are to be started the end of this month at Yokosuka. One of the features of the alterations is the reconstruction of her boilers so that she will use fuel oil instead of coal. This will increase the horsepower.

Similar alteration is expected to be effected on other capital ships.

The *Tosa* will be used as a traget. It is expected that in April, 1924, she will be taken to Sayeki-wan and from there will be taken out to sea off the coast of Tosa Province, and while being towed by the *Settsu* will be subjected to the firing of the guns of the *Mutsu* and *Nagato*, also destroyers, and aeroplanes will drop bombs on her until she is sunk.

In preparation for this she is being temporarily equipped with armor similar to that on other ships.

This information has not been confirmed.

JAPAN.

NAVAL PERSONNEL CHANGES.

February, 1924.

The following changes in personnel have been announced:

Old assignment.	New assignment.
Admiral Prince Hiroyasu Fushimi, member war council	Commander in chief, Sasebo.
Vice Admiral S. Horiuchi, vice chief general staff	Commander in chief, Yokosuka.
Admiral Nomaguchi, commander in chief, Yokosuka	Member board of admirals.
Rear Admiral K. Matsumura, commanding fifth division	Commanding Chinkai Naval Station.
Rear Admiral T. Inusuka, aid to Prince Regent	Commanding fifth division.
Rear Admiral K. Shikama, attached to general staff	Commanding Ominato Naval Station.
Vice Admiral S. Kuwashima, commanding Chinkai Naval Station	Attached to general staff.
Vice Admiral H. Saito, commander in chief, Sasebo	Member board of admirals.
Vice Admiral K. Kobayashi, member board of admirals	Waiting list.
Vice Admiral H. Kaneda, attached to department of matériel	Waiting list.
Rear Admiral Tosu, naval attaché, London	Staff officer, general staff, instructor naval college, member technical council.
Rear Admiral T. Imaizumi, attached to Kure	Waiting list.
Rear Admiral Kurose	Waiting list.
Rear Admiral I. Takemitsu	Waiting list.
Rear Admiral J. Yokochi	Waiting list.
Rear Admiral Nagano, naval attaché, Washington	Staff officer, general staff, member technical council.
Capt. J. Sakai	Placed in reserve.
Captain T. Matsuoka	Placed in reserve.
Commander J. Nakamura	Placed in reserve.
Commander S. Komatsu	Placed in reserve.
Engineer Captain K. Kobatake	Waiting list.
Admiral Suzuki, commander in chief, Kure	Commander in chief, first fleet; also commander in chief, combined fleet.
Admiral Takeshita, commander in chief, first fleet	Commander in chief, Kure.

The Japanese press comments on the above changes as follows:

The assignment to duty as war councilor of Admiral Nomaguchi is said to be prologue to his retirement from the active service in April, and by transfer of Prince Fushimi from war council to Sasebo makes the naval representation lacking in the council, and to avoid this Admiral Nomaguchi will be given the assignment till April.

As regards Prince Fushimi's assignment to commander in chief, Sasebo, it is said, this is to give him better qualification for becoming gensui in the future, to serve as a member of the supreme war council. It will also tend to help foster better naval spirit among officers and men, bringing the only royal flag officer in closer contact with them.

As for successor to Nomaguchi, commander in chief at Yokosuka, such men as Takeshita, Suzuki, and Okada were named, but finally Vice Admiral Horiuchi was assigned. The reason is that the first two were only very recently given new assignments, and there was good reason why Vice Minister Okada could not be spared from his present position. Vice Admiral Horiuchi once served as chief of staff at Yokosuka, and being familiar with the station it will make his work there easy and pleasant.

The assignment of Vice Admiral H. Saito from Sasebo to board of admirals perhaps means that he is to retire shortly.

Vice Admiral Kuwashima, an authority on torpedoes, was placed on the board of admirals. Out of the flag officers placed on the waiting list, Vice Admiral Kaneda, who is an authority on gunnery, is much to be deplored, as is also the case with Vice Admiral Kuwashima.

Vice Admiral Kobayashi, due principally to his failing health, seems scheduled for retirement in the near future.

After all, the present changes are the rounding up of personnel reduction due to the limitation and also for filling vacancies left by Nomaguchi, Kaneda, Kuwashima, Oishi, and others. It is a reasonable one, lacking any striking features.

JAPAN.

URAGA DOCKYARD.

February, 1924.

On January 25, 1924, Uraga Dockyard was visited. This yard now employs about 3,000 workmen. At the time of the earthquake 4,000 men were employed, and at one time 6,000 men were employed.

The damage to this yard caused by the earthquake amounted to about 4,000,000 yen. The greatest damage was caused by fire. The dry docks are undamaged; the building ways are practically undamaged, as evidenced by the fact that two destroyers *Nos. 11* and *23* are now building. The keel plates only are laid. *No. 23* was laid on January 24. Hardly any damage was done to the sea walls.

The principal activity of this yard is the building of destroyers, *Nos. 8*, *11*, and *23*, the light cruiser *Abukuma*, and two 3,000-ton railroad ferryboats which will run between Aomori and Hakodate.

Destroyer *No. 8* was launched just before the earthquake and escaped injury. The keel of *No. 11* had just been laid and consequently

suffered no damage; *No. 23*, as stated above, was laid since the earthquake. The *Abukuma* was in dry dock on September 1, but was undocked before the earthquake and escaped damage. The ferryboats were launched before the earthquake and escaped injury.

The dates of completion of all these vessels will be delayed, and no definite dates are given, but it was stated that the *Abukuma* will not be completed before the end of 1924.

An effort was made to obtain constructional data, dimensions, and geological data on the dry docks, building ways, sea walls, etc., but the authorities of the yard stated that due to the fact that their office was destroyed by fire they lost all their drawings and plans and do not themselves know these facts. The dry docks, however, are made of brick, and the foundation is solid rock. They say that they excavated to a depth of about 20 feet to reach the solid rock.

At present this yard does not build turbines, but a turbine-manufacturing shop is now in course of construction. Parsons turbines manufactured by Mitsubishi will be placed in the *Abukuma* and destroyers *Nos. 8* and *11*. Metropolitan Vickers type turbines will be placed in the two railroad ferryboats and in destroyer *No. 23*. The horsepower of the ferryboats is 6,000. The engineer inspector stated he did not know the horsepower of destroyer *No. 23*.

The authorities stated that the working capacity of this yard was not reduced by reason of the earthquake.

I was taken on board the *Abukuma* and escorted around the top deck. The ship is not in a sufficient state of completion to reveal any points of interest—otherwise it is certain that I would not have been taken aboard. I was told that she is a sister ship of the *Isuzu* and will carry four guns of 14-centimeter caliber and four anti-aircraft 7-centimeter guns. Whether or not she carries mines and torpedoes I could not ascertain, but I have previously been told that all modern light cruisers carry mines.

A naval officer at this yard stated that first and second class modern destroyers carry mines. After making this statement he seemed to wish to retract it, as though he had said too much, and he modified it by saying that not all of them are fitted to carry mines.

ITALY.

GUNNERY PRACTICE NOTES.

February, 1924.

The following information relates to recent gunnery practice of the *Dante Allighere:*

Trials were conducted off Taranto at a range of 26,000 meters for the turret guns. The trials were a total failure, as the ship's new

tripod mast is too insecure and "whippy" to permit of the use of the main director station. This mast is tied to the main deck only and must be extended to the protective deck as are the masts of the other ships of this class, which are satisfactory, apparently. The failure of these trials were in no sense a condemnation of the Girardelli system of fire control.

Trials were conducted with the secondary battery of the *Dante Alligheri* at a range of 6,700 meters (4.7-inch guns) controlled by the Girardelli direction system (not through control station) and gave eminently satisfactory results, according to the Girardelli representative.

Both systems on the *Dante*, turret via central station and broadside direct from director station to guns, are a strictly "follow the pointer system."

ITALY.

OBSERVATIONS ON TRIPOLITANIA.

February, 1924.

The political and social conditions and relations in Tripoli present a most interesting study. The Italians have not established themselves here as well as the French have done in Tunis, both because they have been in Tripoli a shorter time and because many of the 11 years of occupation Italy has been engaged in the World War and in serious domestic troubles. At present, however, the Italian administration is beginning a most active and intense campaign of getting the country in pacification, improvement, and colonization.

The Government has had continual trouble with Arab rebels since the occupation. During the war this became very serious, but during the last year or two the Italians have been able to turn more attention to subjugating the interior, and they are pressing this forward energetically. At present the following areas of the territory of Lybia are cleared of rebels and are more or less in a stable condition: All of the territory *to the west* of Tripoli to the Tunisian border; *to the south* for a distance of 50 to 60 kilometers to a range of mountains; *to the east* for about the same distance and then all of the coast cities over to Bengasi with the exception of Sidra. Outside of this territory the country is still in a semirevolt and is unsafe. The Italians are pushing further south continually, establishing outposts and bringing up the railroad and telegraph lines as they go. The rebels are not organized, but they wage a nomadic type of warfare and are very difficult to catch or to decisively defeat.

They have obtained their arms by capture from the Italians, and the Italians believe they also obtain munitions from Egypt. The Italians are very severe with the Arab rebels when captured, and it is understood that the regular punishment is death. Many of the Italian civil population feel that the military is too severe. Nobody cares to speak much about the reasons for the Italians being in Tripoli nor about the severity of the Italians toward the rebel Arabs—all of which is quite natural. They did speak, however, of a recent hanging of about 100 rebel Arab leaders around Bengasi. The Arab rebels are apparently getting in a more and more desperate situation, however. They are being driven farther south continually and are having their sources of supply cut off. There is no difficulty experienced in the city of Tripoli with the Arabs. In the territory which the Italians occupy the Arabs have no authority at all. The Arabs would prefer to be again under the Turkish rule rather than Italian, principally, however, because of a common religion which they have with the Turk.

Generally speaking, conditions are a great deal more satisfactory than they were a short time ago, and they are apparently improving rapidly.

The Italians have one or two daily newspapers in Tripoli, and they are doing all possible to spread their culture in Tripoli and Lybia.

The local governor has the reputation of being a very strong and capable man. He is much feared by the natives and much respected by the Italians. Foreigners give him credit for much that has been accomplished in the last two years, and it is understood that at the request of Mussolini he will remain in Tripoli indefinitely.

One of the primary aims of the Italian Government is to make Tripoli a subject for Italian colonization. But the Government must first subdue the Arabs and make the country safe and attractive before it can attract colonists. So far neither of these conditions have been fulfilled to an extent which would bring colonists.

In this connection mention is occasionally made by the local Italians to the recent colonization fiasco, when about 200 Italian immigrants were brought down from Italy and where, in a week or two, three-fourths of them had returned to Italy. The Arabs and the Italians, of course, mingle very little socially as yet.

Living conditions are generally very poor. The Italians have established their own schools and churches. Practically all of the labor is either Arab or Maltese. Aside from Italians, there are very few Europeans in Tripoli.

Italian money is used exclusively in Tripoli. There are two or three Italian banks with branches in Tripoli.

The Italian Government is spending a great amount of money in Tripoli, not only on its army and their campaigns, but upon public improvements of every sort. This expenditure will also have to continue for some time in the future. So far and for some time ahead it will be nothing more than an investment on which there are few returns. Many foreigners and local Italians are skeptical as to the return which will be obtained on this huge investment.

Agriculture is the chief and practically sole occupation of the native population. This has fallen off a great deal during the last 10 years, although the Italian officials are making every effort to increase production and they will probable soon introduce immigration.

There is no mining, and no mineral deposits have yet been discovered. The Government has begun investigations in this line, but as yet nothing has been found. It is hoped that mineral will be found in the mountains to the south.

There are no shipyards nor repair facilities.

At present in Tripoli the imports far exceed the exports. The only export going to America is an occasional batch of hides. A small amount of grain is exported. Practically everything else must be imported.

Italian shipping companies have a predominance in shipping and commerce of Tripoli; they have almost a monopoly. A German vessel calls once every two weeks. There are regular sailings for Tunis, Bangasi, and Italy.

The most striking feature of the city of Tripoli and the surrounding country are the modern improvements which the Italians are undertaking. Tripoli is not much of a city to be proud of, but in 20 years it will be. Construction is being done everywhere—buildings, streets, parks, harbor facilities, communications, etc.

The entrance to Tripoli harbor is rather difficult and must be made with care. The depth of the harbor averages 7 meters at present. In their project of port improvement the Italians will dredge to a depth of 9 meters in order to allow their heavy men-of-war to enter the port. This project includes building a new breakwater (construction commenced), building a new and more powerful lighthouse (construction commenced), and the building of docks and slips. There is one completed dock at present. All ships go alongside this to load or unload. Lighters are very scarce. There are three or four small floating cranes and one dredge in the port. There are no mechanical loading or unloading appliances. Anchorage can be made inside the breakwater.

The beaches adjacent to the town are exposed, rocky, and full of reefs and dangers. The only safe place to effect a landing in case of occupation is inside the port, except under very ideal weather

conditions, when it might be possible to land to the east of the city. Inside the harbor there are any number of good landing points.

There is no oil kept in Tripoli and no oiling facilities. Coaling is slow and done by natives. There are no shipyard repair facilities.

The streets and the buildings are a mixture of old and Arab dwellings and modern European ones.

Transportation is meager.

The water supply comes into the city from the south by a siphon or pipe line. Wells are used to a large extent. Sanitation good, considering local Arab conditions.

There is an electric light plant located on the water front street.

There are two railroad stations in the city. The railroad runs off in two directions, one to the southeast, the other to the southwest. The railroad is narrow gauge, and each one of these lines extends about 50 kilometers inland. It is intended to extend a line to the west and eventually to join with the Tunisian railroad. The railroad system is being gradually enlarged as the country becomes more pacified.

There are two cables, one to Syracuse and one to Malta. The service on the Malta cable is by far the more efficient. There are two radio stations in the town. Both are for government use only. The military station is used for communicating chiefly with the outposts in the interior.

There is no telegraph or telephone communication to the east. Commercial messages to Bengasi must go first to Syracuse by cable and thence to Bengasi. There is a government radio communication to Bengasi.

The roads in the vicinity are Italian built and are very good.

Mail arrives and departs on an average of twice a week.

There are between 15,000 and 18,000 Italian troops in Lybia at present. A great part of these are Italian blacks, colonial troops from the Red Sea region. In the warfare against the Arabs, the Italians all are most laudatory of the conduct of these colonials; they rate them as being most excellent troops.

There is apparently a good deal of friction between the army officers and the Italian civil officials in Tripoli. Army officers and soldiers are everywhere in the city of Tripoli, and it is not difficult to see that the city and territory is under a virtual military occupation.

The Italians have very little if any artillery of large caliber in Lybia. Their warfare against the Arabs does not permit this. There are no mobile defenses to Tripoli.

The Italians have built up a very excellent defense of the city of Tripoli and a system of outposts extending back into the interior. They have protected the city itself by about a 12-foot wall

extending entirely around it and constructed so as to make defense by machine or rifle very easy. There is no necessity for this wall to withstand artillery fire, as the Arabs have none. Outside the city there are about 10 concentric systems of trenches and fortifications, supported by block houses and barbed-wire entaglements. At intervals on these block houses are established tall signal stations, so that the word of any disturbances or approach of rebels could be quickly relayed from the interior to the city in case there were no radio communication. A force like the Arabs, without artillery, would have little chance of overcoming such a strong and centralized protection as surrounds Tripoli. On the other hand, the city is entirely undefended from the sea.

So far the Italians have made no effort toward establishing a naval base at Tripoli. Their naval forces consist only of a yacht and one or two small torpedo boats. There is no naval shore establishment of any size. There are none of the facilities of a naval base existing at present. The naval forces man the naval radio station on the western side of the port.

As mentioned before, the Italians intend to dredge Tripoli harbor to a depth of 9 meters. At present their heavy ships can not enter the port but must anchor outside, which is very disagreeable and dangerous for boating.

The army has so far had the bigger job in Tripoli, but it is safe to presume that as soon as the country is pacified to a degree of certainty that attention will be directed toward developing Tripoli as an Italian naval base in North Africa, as Bizerti is for the French. All naval information gained in Tripoli points to this assumption.

The Italian navy in the earlier part of the campaign against the Arabs took an active part in conjunction with the army, but now, as all of the activity has shifted inland, the navy plays no part against the rebels.

There are no coast defenses at Tripoli. As yet, the Italians have had neither the necessity nor the time nor the money to erect permanent defenses. But like the establishment of the naval base, it is a very safe assumption that some system of defense from the sea will be put into effect eventually. It would seem that the protection of Tripoli and its environs by coast-defense forts would be very difficult, because the terrain is perfectly flat in Tripoli and its environs. There are no eminences which could command the harbor and its approaches. Because of the difficulty of effecting a landing anywhere in the rear or to either side of the town, the city could well be defended from the sea by an extensive mine field. Conversely, in endeavoring to take this port, three factors must be borne in mind: First, that there are no artillery sea defenses and that the

town could be easily reduced by bombardment: second, that a landing anywhere along the coast in the vicinity of Tripoli would be very difficult to effect in any but the calmest weather, and then the landing party might be cut off immediately from the fleet: third, that the port approaches could be well protected by a mine field.

There are no railway batteries, armored trains, or heavy tractor guns for coast defense.

ARGENTINA.

NAVAL PERSONNEL STRENGTH.

January, 1924.

The following information has been received from the Argentine Ministry of Marine:

The total number of the personnel actually in the service of the navy is distributed as follows:

Officers	736
Retired officers on active duty	62
Chief petty officers	648
Petty officers	2,201
Enlisted men	1,727
Conscripts	5,431
Apprentices	930
Naval school	285
Lighthouse service	247
Prefecture general of marine	2,082
Pilots	8
Civil personnel	359
Total	14,716

The naval reserve is being reorganized and no data is available at present.

GERMANY.

MILITARY TRANSPORTS IN THE BALTIC DURING THE WAR.

[Translation of article by Vice Admiral Rösing (retired), Imperial German Navy.]

Besides the general commercial traffic with the Scandinavian countries, two main highways having military importance developed in the Baltic as in the English Channel. One led to Lulea in the Gulf of Bothnia and the other to Libau. The high-grade, phosphorless Swedish ore was absolutely necessary for the German ammunition industry. The annual demand for 4,500,000 tons had to be supplied in the seven to eight months in which the Gulf of Bothnia was free of ice. The traffic began in the summer of 1915 in its full

strength, after it was found that the presence of the German fleet kept the Baltic clear of the British and Russian fleets. Encouraged by national guaranties and a sufficiently high freight tariff, the German shipping companies put all their idle freight steamers in this service. Swedish vessels also assisted. During the war, approximately 19,000,000 tons of Swedish iron ore was delivered to Germany, about 1,500,000 tons of which were brought by foreign vessels. Special routes were prescribed on account of the danger of mines, and these were used regularly. After a number of steamers had been sunk without warning by enemy submarines, convoys were organized. The vessels destined for Lulea gathered at Swinemunde three times a week and (up to 20) were convoyed to Landsort Island by armored merchantmen or old torpedo boats. They were then in Swedish coastal waters and protected by the Swedish Navy from attacks by Russian naval forces. On the return trip the steamers were met at Landsort by the convoy. There were a number of attacks by submarines or torpedo boat destroyers which were parried by the convoy ships, although owing to a lack of suitable vessels it was impossible to have a convoy consist of more than three or four ships. If the offensive action had been more energetic, the Russians could have made it very disagreeable for our transports.

The reserves for the German Njemen Army went overland to Liban. As the railroad facilities between Memel and Libau were very limited and this trajet was also threatened by the Russians in June, 1915, the commander in chief of the Baltic division requested the naval transport division of the navy department to organize a regular transport service. In the course of time 52 steamers and 29 tugs, with a total tonnage of 120,000 tons, were placed in this service. Besides troops, equipment, and horses, they carried such things as food, ammunition, clothing, coal, and cattle. The return freight consisted of empty artillery material and industrial products such as wood, barley, seeds, and buckwheat. Post and men on furlough were sent on special steamers. Hospital ships were used for the sick and wounded. As the ships used in this transport service were mostly foreign, confiscated, or prize steamers which were not under the management of a German shipping company, they were turned over to the "Vereinigten Bugsier und Dampfschiffahrtsgesellschaft" in Hamburg. This company upon the receipt of a proper sum as reimbursement for its services, took over the ships allocated by the naval transport division and assumed the duties of an ordinary shipping company in so far as concerned preparation, operation, and management. It engaged the crews and looked after their needs, supplied the ships with coal, material, etc., and represented them in all business with the harbor authorities, while the schedules and freight were in charge of the military authorities.

On two occasions the transport division had to take charge of the transportation of a large troop expedition—once for the landing on Oesel in October, 1917, and again for the transfer of a strong military division to Finland in March, 1918. The expeditionary corps for Oesel consisted of 23,000 men, 5,000 horses, and 1,400 conveyances, with the requisite number of guns, baggage, and ammunition. In order to transport this material, 12 large combination freight and passenger steamers and 4 small confiscated English freight steamers of a total tonnage of 110,000 registered tons, were equipped, manned, and operated by soldiers. There was also a number of small ships, lighters, tugs, and salvage ships. There was more or less difficulty about getting the larger ships ready, as they had been laid up since the beginning of the war, so that they had to be put in dry dock to have the bottoms cleaned. The engines had also all been taken apart and packed away, and in many instances the copper portions had been removed. But, thanks to the energy and efficiency of the Hamburg and Bremerhaven shipyards, they could be made ready for service in 10 days. Owing to the short distance to be traveled, it was possible to overcrowd in making up the cargo, and as the food was prepared in field kitchens it was not necessary to provide kitchen equipment. A portion of the troops and heavy material was sent in echelons from Libau to Arensburg. The army transferred to Finland consisted of about 10,000 men, distributed over 10 steamers. At Oesel we had the enemy to contend with not only at sea but in making a landing; the Finland expedition was, however, not troubled in this regard, but the trip was rendered very difficult owing to the thick ice. In both cases the transport fleet was divided into groups of four or five ships for the crossing; these were under the command of naval staff officers and were convoyed by small cruisers, which used the route through the mine fields prepared by the mine-sweeping division.

In comparison to the tasks of the British Navy in this regard, our transport duties in the Baltic were only slight, but they very greatly relieved the strain on the overworked German railroads and therefore formed an indispensable unit in Germany's heroic battle for freedom, which it finally lost, to the great detriment of humanity.

GERMANY.

THE ORGANIZATION OF THE HIGHER NAVAL OFFICIALS DURING THE WAR.

[Translation of article by Lieutenant Commander Groos, Imperial German Navy.]

The opinion has been very generally held, not only at home but also abroad, that Admiral von Tirpitz had as decisive an influence

on the conduct of the naval war as was exercised on the military operations by the higher army authorities. This assumption is quite natural on account of the leading position held by the admiral for so many years. As a matter of fact, however, at the outbreak of the war the chief of the admiralty staff who had previously been treated with a more or less patronizing attitude, now took precedence over the secretary of the navy without being vested with sufficient authority to effect cooperation and coordination of the numerous commanding units.

The basis of the coordination of command and administration in the person of an admiral (chief of the admiralty) was abandoned already in 1889. In its place an imperial decree of March 30 established a "chief naval command" and an imperial navy department. The first was administered by a commanding admiral with the duties and rights of a commanding general, and the latter by a minister with the rights of an upper official and under the jurisdiction of the prime minister. At the same time a special cabinet for the consideration of naval affairs was instituted parallel to the corresponding arrangement in the army.

This distribution of authority very soon led to uncertainties which had their influence on the healthy development of the navy. New instructions defining the jurisdiction of the above-mentioned departments had to be issued continuously. Friction of this kind made itself felt very disagreeably not only in the province of operative preparations for war and the transition of the navy from a peace to a war basis, but also in other branches of administration, and also, for instance, in cooperation with the press. The desire was often expressed that this condition of affairs be changed, but even in 1892 an imperial decree vetoed any alteration, and a change only came about in 1898 when Admiral Tirpitz became secretary of the navy.

There was no question of a return to the former admiralty, as the Kaiser was scarcely willing to allow any person possessing the powers of the chief of the admiralty to come again between him and his pet creation. However, on May 5, 1898, an imperial decree granted the new secretary of the navy the same powers held by the Prussian war minister in the army. From now on he was in charge of general naval interests, naval representation abroad, and the exclusive communication with the higher government authorities. As an experiment the province of naval communication, as well as the political application and preparation for the use of the navy abroad in time of war, was transferred from the chief command to the navy department. This was in accordance with an imperial decree of March 14, 1899, inspired by a memorandum of Admiral

Tirpitz, and formed the basis of the organization of the higher naval authorities up to August, 1918.

The upper naval command was done away with and all the various departments were dissolved up to the admiralty staff. This was an independent organization under the designation "Admiralty staff of the navy." Besides purely staff business, the new authorities had charge of the military political affairs of the vessels in foreign waters. The chief of the admiralty staff was directly responsible to the Kaiser as well as the chief of the naval stations in Kiel and Wilhelmshaven, the inspector of the training division, the chief of the I squadron (later the chief of the high seas fleet) and the chief of the cruiser squadron. These commanders were accorded the authority in matters of discipline and furlough, such as was formerly held by the commanding admiral. The inspection of torpedoes and naval infantry was in charge of the commander of the Baltic naval station, while the inspection of the naval artillery was in charge of the commander of the North Sea naval station, but the existing relationships between these authorities and the imperial navy department were untouched. The Kaiser reserved the right in the event of mobilization (and annually for the duration of the autumn maneuvers) to appoint a chief of fleet, as well as a general inspector, who would receive instructions from him directly in each single instance regarding the carrying out of inspections within the entire navy.

The commanders of vessels in foreign waters were directly responsible to the Kaiser in all military political matters. The regulations for mobilization were in charge of the secretary of the navy.

The reason given for the dissolution of the upper command and the creation of so many intermediate authorities was that His Majesty the Kaiser, after deciding to take over personally the chief command of the navy and the army, did not deem it advisable to have a central command between himself and the individual commanders who would only have to transmit the imperial orders. Therefore the authority of the newly created admiralty staff was exceedingly limited. It was in charge (*a*) of the admiralty staff business of the navy, and (*b*) of the military political affairs of the vessels and groups of vessels in foreign waters.

It was only authorized to issue commands in so far as they entailed the communication and execution of imperial instructions in military political matters for the vessels in foreign waters. The idea and purpose of the new organization was without doubt Admiral Tirpitz's intent to effect the supremacy of the technical and administrative officials—that is, the imperial navy department. His reasons were set forth in his memorandum of March 10, 1899:

Before the creation of a large fleet is possible, the question must be solved as to how this fleet can be created. The greatest task of the last decade was to solve this problem and get a clear grasp of the tactical and strategical use of the naval forces in order to effect the correct formation and organization of the fleet. In order to solve this problem, all the energies of the navy had to be concentrated on this one point and all matters regarding training and tests be temporarily secondary to the main issue. A very strong central commanding unit was necessary to do this. Before the fleet law was possible, the higher naval authorities had to perform the great work of the nineties and create a tactical policy for the fleet. After this has taken place, the principal work of the next decade will be to develop the fleet law further on the basis of the knowledge and experience of the nineties and to create a fleet such as Your Majesty may deem necessary in order to advance Germany's political and economic power in the coming century. The "great" tasks of the next period of development do not lie therefore in the province of a central administrative body, but will have to be solved by those officials to whom Your Majesty has delegated the task of providing the ships and personnel, as well as the development of the existing nucleus of a navy. In order to execute this task, the authorities need greater freedom of action.

The memorandum stated distinctly that this organization was not to be permanent, but was to keep in step with the other naval developments—namely, the carrying out of the law for the development of the fleet. This task, under the leadership of a man like Tirpitz, was brilliantly accomplished, and the omissions of a century were rectified in a decade—i. e., the creation of an imposing naval power. It is quite comprehensible that this was not possible without some sacrifice. The fact that this sacrifice fell on the admiralty (the brains behind the preparation for war) left a bitter revenge. As may be seen from the communication of the chief of the admiralty to the secretary of the navy in March, 1900, the admiralty very soon saw that with the material and personnel on hand it was not able to fulfill the tasks allotted to it and "furnish His Majesty at any time with complete and trustworthy material upon which to base the decisions regarding fleet operations in time of war." The intelligence service of the admiralty staff was not sufficiently developed. Furthermore, the carrying out of the operations was not sufficiently guaranteed as long as there were not a sufficient number of officers present who, by virtue of their training and activities in the admiralty staff, could be intrusted with the strategical and general military considerations. The naval academy was to be placed more and more in the service of the admiralty staff and a special corps of admiralty staff officers formed, parallel to the methods of the Prussian general staff. But the secretary of the navy was of a different opinion. He was deeply interested in the navy's intellectual preparation for war, but he deemed the tempo proposed by the admiralty as much too rapid. He also had serious misgivings regarding the proposed plans. In a report to the Kaiser on February 13, 1901, he

stated that in spite of the greatest possible increase in the number of officers, there would still be 300 too few in the year 1908.

During the most intensive period of the creation of the fleet the greatest attention had to be devoted to the question of quality. The application of the fleet and the increasing of the duties and tasks of the admiralty staff came second. The year 1904 was the natural time for the first important enlargement of the admiralty staff. The admiralty staff division of the upper naval command at the time of its dissolution in 1899 consisted of 12 officers and 14 officials; the admiralty staff of the navy in 1901 of 17 officers and 28 officials. So much regarding the tempo.

As far as concerns method, the application of army organization to the navy is extremely questionable, because the questions of naval and land warfare are entirely different, and the first had no historical background upon which to build. Other navies would furnish a better pattern than the army. For general staff officers the weight of the training would lie in the special province of troop command; the admiralty staff officers, however, must be expert commissioned officers not only in all branches of admiralty staff work but also in every phase of complicated ship management, and therefore such officers could not be restricted to a special corps. There should be no lowering of the niveau in valuing the abilities and properties of a "front" officer. In the imperial report already mentioned, special stress was laid on the necessity of guaranteeing the navy department especially good material during the development period of the fleet. This part of the report read as follows:

> Mention should not be omitted here that the navy is in need of quality not only in the admiralty staff. Yes, it must be stated quite frankly that in the stadium of the creation of the fleet, the welfare of Your Majesty's future fleet will be much more strongly influenced if quality is lacking in those places where the fleet will be organized and created. The general recognition of this need is therefore much more difficult because the effects and accomplishment are not apparent on the surface, that is, do not make themselves so evident as personal accomplishments, as in other places.

In a further communication of the secretary of the navy, dated March 1, 1901, he held that the naval academy must retain its present organization and purpose of not only training proper naval officers for admiralty staff business, but also to hold other posts under the jurisdiction of the imperial navy department, assuring them special training along technical and administrative lines.

The necessity of bringing the construction of the fleet and the technical and administrative elements more to the fore during the next years found renewed expression in an imperial decree of June 24, 1901, as follows:

As much as I appreciate the efforts of the admiralty staff to assure the greatest measure of efficiency for each period of execution of the naval law, nevertheless these efforts must give place to the necessity of attaining the final goal as soon as possible. Therefore the admiralty staff, in solving the tactical and strategical problems during the carrying out of the fleet law, have only to count on the available personnel and material as well as the available organizations and commissions. However, for the construction of the navy, as well as for the execution of the naval law, it must consider the imperial navy department as competent authority responsible to me. Therefore the admiralty staff must exercise great restraint in so far as concerns the jurisdiction and work of the navy department, limiting same to obtaining information and only calling for my decision in the most urgent cases.

When the admiralty staff had increased to 27 active naval officers after the budget for 1908, proposals were made to decrease its sphere of duty owing to the lack of personnel in other quarters. The secretary of the navy did not deem it correct to develop the admiralty staff along the lines of the chief general staff of the army, as conditions were entirely different in the two branches.

Besides, the principal point at the time was enlargement and development. Only when this was accomplished would the main energies be turned to the utilization of the navy. Under these circumstances it was proper to reduce the number of officers on the admiralty staff and to drop the direct relations between the latter and the admiralty staffs of the " front." The question of the right selection and further utilization of the admiralty staff officers could be turned over to the naval cabinet. Within the given limits it was correct and important to retain the admiralty staff as an operative unit so that there would be a chief of the admiralty as responsible adviser of His Majesty the Kaiser during a war—an adviser who because of the activities of his officials would be in control of all naval strategical questions, and, furthermore, that there might be a centralization point for all experiences gained in the province of naval strategy. The fleet command was not suitable for this purpose, as it was intimately and directly associated with the questions under discussion. Officials on land having a greater range of vision and studying the questions in foreign navies, were much better suited for this purpose. The admiralty staff would represent such a body.

The number of the naval officers of the admiralty staff comprised 1 flag officer as chief, 13 staff officers, 7 lieutenants, and about 5 inactive officers, while the navy department had about twice that number. This, as well as the attitude of the secretary, showed that the difficult task of the admiralty staff in a war requiring the most careful study and preparation and the necessity for a thorough training of a sufficient number of admiralty staff officers was not, or would not, be recognized by the powers that be. In war this omission could not be rectified.

The predominance of the administrative officials, the creation of a large number of other officials in place of the higher command, was conceived by Admiral von Tirpitz purely as a temporary organization during the creation of the fleet. The weakness of such an organization in case of war was perfectly apparent. When this occurred in 1914, it was the admiral himself who, feeling that the navy must now have a head, requested the Kaiser on July 29 to place the administration in the hand of one person. He did not conceive of the resurrection of the old higher command, which, with very limited administrative authority, had nothing to do with the procuring of material and personnel, but of the coordination of the admiralty staff and navy department under one commander in chief with full responsibility and most extensive authority. From such a coordination everything else would have dissolved itself. This would have entailed the immediate dissolution of the two divisions of the upper naval authorities created by the Kaiser at the time of his accession and would have opened the way for the full utilization of the powers and capabilities contained in each in case of war. The name of this organization, as well as the outer form, chosen for the transition to the recreation of the old admiralty, were secondary matters if only there were a chief of admiralty with independent administrative powers in place of the confusion of a large number of administrative officials. As a matter of organization, the admiral considered it quite immaterial whether the chief of the admiralty staff or the secretary of the navy were designated for this post. The only question was as to which was better suited for the position. Under the existing circumstances the admiral as a matter of duty and in agreement with the decision of the naval officers corps could only propose himself. The Kaiser, however, was not inclined to accede to this proposal and, on the other hand, did not want to lose the cooperation of the admiral altogether. The result, as shown in a cabinet communication to Admiral von Pohl, remained an unfortunate "half-way measure." The communication read as follows:

BERLIN, *July 30, 1914.*

His Majesty, the Emperor and King, during this critical time, desires Your Excellency to discuss first with the secretary of the navy all those matters which you have to propose to His Majesty and make a report regarding any divergent ideas of the secretary of the navy. His Majesty does not want Your Excellency to take this as an indication of lack of confidence, but merely as the expression of His Majesty's need, induced by the critical conditions, to avail himself as much as possible of the valued judgment of an advisor with many years of experience in all branches of naval service.

The appointment of the admiral to the direction of the navy was assuredly hindered by the opposition existing between him and the prime minister. The refusal of his proposal would undoubtedly have been much harder if he had been able to support his claims on

the score of mobilization measures. But this motion, which really signified nothing more than the re-creation of the old admiralty (correct as this was), came too unexpected, and in the pressure of all the other business of mobilization the disastrous results of a refusal were not sensed in their fullness and entirety.

The refusal brought it about that the weight of naval administration was transferred to an administrative body in no way capable of meeting the demands made upon it. As a result of the development which the admiralty had undergone in the last decade, it lacked the dominating position over the other officials such as was silently developed by the chief of the general staff of the army, which became more and more evident since the successes of 1866 and 1870 and also during the war, at least after the Battle of the Marne. Under these conditions it would only have been possible for Admiral von Tirpitz as chief of the admiralty to have assumed such a position in the navy. As things now were the chief command of the navy rested in the person of the Kaiser himself. It also fell largely to him personally to adjust the differences of opinion of a large part of the officials. Besides the responsibility of commander in chief, the Kaiser was also faced by political considerations having direct influence on decisions of naval strategy, all the more so as even at the end of the year 1914 the viewpoints of the naval command, the admiralty, and the secretary of the navy regarding the most advisable procedure were widely divergent. In the separation of a large number of naval officials from the person of the Kaiser, the naval command and its influential chief, Admiral von Müller, exerted a far-reaching influence on the naval operations, which was felt principally along the lines of political obstacles. Thus it came about that the admiralty staff and the navy department were represented at chief headquarters only by their chiefs with an entirely inadequate staff, while the actual administration remained in Berlin under the supervision of subordinates.

The situation became even more complicated by the appointment of a number of other officials after the outbreak of the war—i. e., the chief of the Mediterranean division and later the chief of the special command in Turkey, and especially the commander in chief of the Baltic forces and the chief of the marine corps in Flanders. None of these posts were included in mobilization plans. The first mentioned was created at the last moment despite the original regulation which provided for a rigid and continual dependence on the North Sea field of war and the high seas forces to be concentrated there; the latter became necessary as a result of the developments in Flanders which were not premeditated in sufficient time through operative cooperation between the army and the navy. Apart from the small forces which could be continually placed at their disposi-

tion, both (as naval commanders) were dependent on the distribution of forces from the high seas fleet according to the general conditions existing at the time. With such an organization it was scarcely possible in such questions to have any effective work between the fleet, marine corps, and commander in chief of the Baltic forces and distribute the forces rapidly enough to keep pace with continually changing conditions. This was especially evident in the conduct of the submarine commercial war. A part of the submarines were under the jurisdiction of the chief of the high seas fleet, a portion under the commanding admiral of the marine corps in Flanders, and only those submarines (such as the submarine cruisers) which were in the Mediterranean were directly under the jurisdiction of the admiralty staff. A transfer of the center of submarine activity from one theater of war to the other did not take place, therefore, with the rapidity and efficiency which the continually changing military conditions required. For this it would have been necessary to have had other administrative officers in the central organization. However, the reasons have already been given as to why the chief of the admiralty staff, while assuming the entire responsibility according to the directions of the chief military authorities, did not give the commanders at the "front" to understand clearly at the beginning of the war that "the war would be strategically directed by him in the strictest manner and the commanders at the individual theaters of war would only be independent in so far as concerned the execution of the orders of the chief of naval operations."

How far this was from being true can be seen from the fact that even in October, 1917, an imperial decree was necessary stating that "such instructions conforming to those issued by His Majesty to the chief of the admiralty staff were to be observed and followed as commands issued directly by His Majesty."

All suggestions from various quarters, and even from the front, that these confusing arrangements be abandoned came to nothing, mainly due to the opposition of the chief of the naval cabinet. Even on December 11, 1915, Admiral von Tirpitz had written the following communication to Admiral von Müller reverting to the idea broached by him at the outbreak of the war:

> On July 29 of this year I requested Your Excellency to propose to His Majesty to combine the navy department and the admiralty staff under one head and in this way remove the disadvantage of having so many heads and in this way develop the personnel and matériel of the navy to a more powerful and successful end.
>
> At that time, His Majesty was unwilling to accept this proposal, which was also made to Your Excellency later on in the war by the chief of the admiralty, Admiral Bachmann. When circumstances then arose calling for a change in the person of the chief of the admiralty and the question again came up, no

one, unfortunately, paid any attention to me so that for this reason I did not find any opportunity of again expressing my opinion on the subject. The present development of things verifies the correctness of my ideas and contentions at that time.

While the army, fighting on a number of "fronts" with a great number of troops, had arranged practically a cooperation of the military operations division (and one can also say, administration) under one head and thus assured the greatest possible utilization of all aids, the navy, in spite of the much simpler conditions existing, was managed by many administrative heads. The unfavorable effect of this did not fail to be felt and evidenced itself at every new measure that was taken. To take only one simple instance: Not only the navy department but the admiralty staff, the commander-in-chief of the Baltic, the commander-in-chief of the fleet, and the Baltic naval station were all concerned with the preparation of a torpedo boat for Baltic service. Delay, squandering of power, useless expenditure are the inevitable results.

A commander-in-chief with headquarters in Cuxhaven or Wilhelmshaven (such as conceived by General von Caprivi) as the only solution in the event of war and such as the Austrian Navy possesses in Admiral Haus, would have removed all this, and my suggestion at the time would have led to this end of itself. For the practical direction of the navy department and admiralty staff would only have been possible through close contact with the commander-in-chief of the fleet. To-day it is too late for a great many points along this line. The conditions have become increasingly difficult for the navy as a whole and for the fleet in particular. The prospects have immeasurably decreased; nevertheless, because of this very fact, I consider a change advisable even to-day. We can in no way even approximately equalize the significant increase in power on the part of the enemy. We can equalize something of it, as in all other provinces, only through the power of our organization. Therefore I would again urge a change made even at the last moment. And I therefore revert to my proposal made to Your Excellency at the outbreak of the war. To-day I am ready to assume the direction of the fleet in the sense proposed, provided the centralization of our entire naval administration also takes place as briefly outlined in the above. For without this the successful direction of our naval forces is impossible.

But quite independent of my person, I once more request Your Excellency not to turn down my suggestion, but to recommend to His Majesty the rapid execution of this condition, the only one possible—i. e., to create a commander-in-chief who, under the jurisdiction of His Majesty, has at his disposition all the powers of the navy and combines in his staff both navy department and admiralty staff.

In the meantime, Admiral von Müller had already reported to the Kaiser his conversation with the admiral and stated that the latter was ready to assume the command in chief of the navy—for it practically amounted to this. "However, His Majesty opposed the idea." Without presenting the communication of December 11 to the Kaiser, Admiral von Müller recommended the admiral to present his ideas himself directly to the Kaiser. This was not done at that time.

The opposition to the organization recommended by Admiral von Tirpitz as unavoidably necessary was only overcome when Admiral Scheer was appointed chief of the admiralty staff, as he could throw

the weight of his Skagerrack victory in the scales. According to his idea, in the case of the navy there was no question of a continuous direction of military operations such as was exercised by the chief military authorities on land. If the fleet lost a battle, no one would think of making the admiralty staff chief responsible for it, but only the commander in chief of the fleet. In the direction of naval operations the commanders in the Baltic, North Sea, Flanders, Mediterranean, and elsewhere abroad had to act independently according to their several tasks. Therefore there had to be one organization in charge of the distribution of naval forces, etc., and the attainment of a distinct strategic goal, instead of leaving success to the admirals in command of the forces in the various theaters of war. "A chief administrative organization whose instructions were to be followed meticulously was greatly missed. This was also true in the case of the imperal navy department." As the war continued, the more difficult it became to procure material and personnel for the military requirements spread over such extensive territory, just so much more often was great difficulty encountered in repairing the vessels and submarines and in delivering new constructions. It was extremely difficult to obtain the necessary technical workers from the army administration. The army requirements were naturally given preference. But a really convincing presentation of the navy's needs (Admiral von Tirpitz resigned in March, 1916) in many instances would have led to better and more successful results, for good will and understanding were undoubtedly not lacking on the part of the army. To mention only one point, it required pressing for a half year (from July, 1917, to December) until the submarine department, recommended by the fleet command for all submarine matters, was created. Therefore in the admiral's opinion, a change in the person of the secretary of the navy was necessary, so that the proposed changes could be put through at once. The fear of the chief of the naval cabinet that the Kaiser would never agree to relinquish the main jurisdiction (which in this sense was not intended) was not substantiated. The Kaiser agreed without raising any objections. The chief of the naval cabinet issued the following communication on August 11:

On the ground of to-day's instructions to the chief of the admiralty staff, His Majesty the Kaiser will accord him greater privileges than formerly in regard to the direction of naval operations, granting him the right to issue direct orders to the naval organizations or individual commanders, etc., signing such orders 'Direction of the Naval Warfare;' such orders to be in line with the general instructions issued by His Majesty for the conduct of naval warfare. For this purpose the naval admiralty staff will appoint a special naval staff for chief headquarters with a chief of staff at the head. In Berlin the acting chief of the admiralty will conduct the current business of the admiralty staff in accordance with instructions of the office of naval operations.

This change in organization did not represent a return to the chief naval command of 1899; in time it would have developed into an organization such as the old admiralty. There was no countersigning of the orders of the office of naval operations by the secretary of the navy. The latter was silently placed under the jurisdiction of the former. The special advantage in the change of organization was that naval operations had a seat in chief headquarters in close proximity to the chief military authorities and the chief of naval operations exercised also a decisive influence on the appointments to commands and staff duty, which broke up the former supreme influence of the chief of the naval cabinet. Naval operations consisted of 21 naval officers without any increase in the strength of the admiralty staff. In a regulation of September 16, 1918, it was stated that the "admiralty staff of the navy was raised to the rank of the central authorities in appreciation of its duties and services."

The creation of the office of naval operations came, unfortunately, too late to have any decisive influence in a military way. In the meantime, however, during the war a great deal of energy, etc., was lost in inner friction which should have been avoided on account of the frightfully difficult tasks with which the navy (still in process of development) found itself confronted by the World War. Just how extensive and complicated the question of war material was (under the administration of the navy) can best be seen from an account of the forces on hand in September, 1918.

At that time there were the following forces in the North Sea under the command of the chief of the high seas forces:

(1) Three line-ship squadrons of 18 large battleships under the command of the chief of squadron.

(2) Five battle cruisers.

(3) Twelve small cruisers under the commander of the scouting forces.

(4) Seven torpedo-boat flotillas with 2 cruisers and 77 boats under the commander of the torpedo boats.

(5) Four submarine flotillas with a cruiser, 10 torpedo boats, and about 70 submarines under the commander of the submarines.

(6) Seven airships.

(7) One airplane cruiser.

(8) Two aircraft carriers. There were 152 airplanes available on the ships and aircraft stations.

For the outposts and convoy service for bringing in and out the submarines there were two convoy flotillas and a North Sea outpost flotilla with 186 fishing steamers and 12 blockade runners under the command of the commander in chief of the safety group

of the North Sea, as well as 14 half flotillas, with over 190 vessels of various kinds for mine searching and sweeping service, as well as baggage and lazaret ships.

Besides the above the North Sea station had 85 vessels for outpost and blockade service in the river mouths. The other theaters of war did not have such a quantity of material. In the Baltic there was a commander for the western Baltic and one for the eastern under the supervision of the Kiel naval station. Under the former there were 1 cruiser, 4 auxiliary mine layers, 1 aircraft carrier, 1 torpedo boat flotilla of 12 boats, 1 outpost flotilla of about 70 fishing steamers and 30 motor boats, as well as a special net blockade group for the laying of nets against submarines. The commander for the east Baltic waters, who raised his flag on the armored coast vessel *Beowulf* and operated from Libau, had more mine seekers than anything else. These forces consisted of 4 German and 5 Finnish groups of mine seekers and destroyers with a torpedo boat half flotilla with 5 boats, 2 large mother ships for motor boats, and 145 vessels, 12 coal steamers, fuel oil and supply steamers, 4 hospital ships, and 2 transports. The Baltic forces also had 63 front and 229 practice airplanes.

There was also a great number of ships in Kiel for training and test purposes. Under the supervision of the submarine inspection there there was a group of submarines for salvage and chasing purposes, as well as the submarine school. This was in charge of 25 submarines, an equal number of torpedo boats, and apart from ships for quartering there was also a number of steamers, fishing boats, and a cruiser for the military representation of enemy convoys in offensive maneuvers. Besides all the above, there was a varying number of submarines (up to 20) in Kiel ready for acceptance.

The torpedo-boat inspection, the torpedo-testing command, the mine inspection, the technical testing commission, the artillery and naval schools also all had a large number of vessels for their particular purpose, from line ships to the older torpedo boats, fishing steamers, and tenders. Three torpedo boat flotillas with 33 boats were permanently detailed to the commanding admiral of the marine corps, and the commander of the Flanders submarines had 2 submarine flotillas with 20 boats. He had over 72 vessels and 100 airplanes detailed to him as mine seekers, outpost boats, "Fernlenk," and motor boats.

The Mediterranean division in Constantinople consisted of the battle cruiser *Goeben* and 3 submarines with a proper number of auxiliary ships. The two German submarine flotillas in the Mediterranean, as well as (temporarily) the submarine cruiser group as the only floating naval forces, were directly detailed to the chief of

the admiralty. This latter consisted of about 24 submarines divided between Pola and Cattaro and were under the command of the Mediterranean submarine commander. Also in the Crimea (Sebastopol) at the close of the war there was a naval division in charge of 36 mine seekers, motor boats, and steamers whose particular task was to endeavor to recommission the captured Russian war vessels. Naval air stations with very limited personnel were located in Constanza and Xanthe, while special naval commands were located as far as Euphrates.

Tables 1 to 4, indicating the development of the floating war material of the navy during the World War, will show the amount of technic and administration that were necessary to procure the forces and keep them going. The tying up of the main forces of the nation in land warfare naturally restricted very greatly the construction of line ships and battle cruisers during the war. In spite of the new small cruisers, the number of these vessels decreased continually during the war owing to the losses. The comparatively large number of older line ships, apart from those of the II squadron, scarcely appeared in the North Sea. They proved to have too little endurance against the effects of modern torpedoes and mines. In the beginning of 1916 it was necessary to place these ships out of commission owing to the great need of personnel for submarines and mine seekers. Their guns were used on the land fronts. The same thing was done with the old large cruisers after they had been used in the Baltic before being placed out of commission.

The number of torpedo boats steadily increased from 100 at the outbreak of the war to 194 in May, 1917. But then the number was greatly reduced as the result of heavy losses. As may be seen from Table 3, the number of airships and airplanes at the outbreak of the war was unusually small. The first reached its climax in July, 1917, with 21 ships, decreasing rapidly from this time, while the airplanes, which began with 6 land and 6 seaplanes, in September, 1918, numbered 775 seaplanes and 360 airplanes. The most interesting figures are in connection with the submarines. In spite of all the losses during the four years of war, the number amounted to about 10 times what it had at the beginning.

These tables show very clearly what gigantic efforts were made to keep up with the changing demands of the naval warfare in spite of the fact that the main energies of the nation were absorbed in land warfare and the organization presented such a serious handicap. A special submarine department and aeronautical department and factory department were created in the navy department (bureaus of submarines, aeronautics, and construction). The development into an open war of material proved Admiral von Tirpitz correct when he advocated the consolidation of all powers of the navy under one

head through the combination of admiralty staff and navy department—that is, the creation of a central command and administrative post. As this idea, however, came too unprepared to be immediately put into effect at the outbreak of the war, the peace organization founded by the secretary of the navy turned against its own founder during the war. But this is only a partial phase of the problem. The army also, in spite of the supreme position of the chief of the general staff of the army and later the higher military authorities with the divisions into general staff and war ministry, also suffered from the general organization. It was still more serious that no measures were taken for the cooperation of army and navy or for the cooperation of these factors with politics, finance, and economics, which would have guaranteed the most practical and smoothest consolidation of all the powers of the nation for the attainment of the final goal. Germany, "the land of organization," found no solution for such a treatment of the problem of organization. In other countries, where within and without the military circles one saw the war coming and found more favorable conditions existing in the form of government, the question of organization succeeded more happily. At the beginning of the war England had the "defense of the realm" committee in which all questions regarding the war were discussed regularly and in detail under the chairmanship of the prime minister and in the presence of the entire cabinet after proper preparation by subcommittees, and the main principles of the measures to be undertaken were established. The prime minister conducted the war under full responsibility of all the other ministers. Such principles of organization exist in the United States and are even more sharply drawn. Other nations also have devoted great attention to the consolidation and cooperation of all national powers during a war. However, much more important than the search for the best organization is the choice of the leading personality. But even this will succeed better the more correct are the conditions existing in organization and form of government.

TABLE 1.

LARGE BATTLESHIPS.

Date.	Line ships.			Battle cruisers.			Foreign.
	Number.	Ready.	Baltic.	Number.	Ready.	Baltic.	
Aug. 5, 1914	15	13		5	4		1
Oct. 14, 1914	17	16	(8)	5	5	(1)	1
Mar. 13, 1915	17	17		5	4		1
Dec. 27, 1915	17	16		6	4	(1)	1
May 31, 1916	18	16	(1)	6	5		1
May 17, 1917	19	19	(1)	6	5		1
Sept. 21, 1918	19	15	1 (3)	6	6	(1)	1

TABLE 1—Continued.

OLD LINE SHIPS.

Date.	Number.	Ready.	Baltic.
Aug. 5, 1914	22	8	(14)
Oct. 14, 1914	22	22	(7)
Mar. 13, 1915	22	15	6
Dec. 27, 1915	18	12	8 (8)
May 31, 1916	12	9	3 (1)
May 17, 1917	8	4	1 (3)
Sept. 21, 1918	5	1	1

OLD LARGE CRUISERS.

Date.	Number.	Ready.	Baltic.	Foreign.
Aug. 5, 1914	7	3	(5)	2
Oct. 14, 1914	8	6	1 (1)	2
Mar. 13, 1915	3	3	1	----
Dec. 27, 1915	2	1	2	----
May 31, 1916	----	----	----	----
May 17, 1917	----	----	----	----
Sept. 21, 1918	----	----	----	----

SMALL CRUISERS.

Aug. 5, 1914	29	20	8	7
Oct. 14, 1914	27	22	6 (1)	7
Mar. 13, 1915	23	17	6 (2)	2
Dec. 27, 1915	23	19	6 (3)	1
May 31, 1916	23	17	7 (1)	1
May 17, 1917	21	16	4 (2)	1
Sept. 21, 1918	18	15	2 (2)	----

TORPEDO BOATS.

Date.	Number.	Ready.	Baltic.
Aug. 5, 1914	100	66	9
Oct. 14, 1914	135	109	11 (24)
Mar. 13, 1915	150	104	35 (16)
Dec. 27, 1915	191	138	50 (72)
May 31, 1916	193	156	43 (43)
May 17, 1917	206	159	45 (41)
Sept. 21, 1918	168	115	40 (24)

TABLE II.

MINE SHIPS.

Aug. 5, 1914	14	8	4
Oct. 14, 1914	11	11	7(1)
Mar. 13, 1915	10	10	7(1)
Dec. 27, 1915	9	8	6(3)
May 31, 1916	8	6	5(2)
May 17, 1917	9	7	6
Sept. 21, 1918	6	6	4

TABLE II—Continued.

MINE SWEEPERS.

Aug. 5, 1914	106	53	26
Oct. 14, 1914	107	107	26
Mar. 13, 1915	116	99	34(15)
Dec. 27, 1915	126	125	39(15)
May 31, 1916	170	154	53(24)
May 17, 1917	197	191	29(9)
Sept. 21, 1918	394	338	146(10)

AIRCRAFT CARRIERS.

Aug. 5, 1914			
Oct. 14, 1914	2	2	2
Mar. 13, 1915	2	2	1
Dec. 27, 1915	3	1	3
May 31, 1916	3	3	3
May 17, 1917	2	2	2
Sept. 21, 1918	3	3	1

NOTE.—The coastal armored ships, the harbor flotillas, and training ships, etc., are not included in the above figures. The figures in parenthesis indicate the ships that were temporarily detailed for Baltic service or there for repairs.

TABLE III.

SUBMARINES.

Aug. 5, 1914	27	16	13
Dec. 27, 1915	63	35	27
Oct. 24, 1916	128	81	47
June 5, 1917	154	104	31
Sept. 21, 1918	180	83	59

AIRSHIPS.

Aug. 5, 1914	3	1	
Dec. 27, 1915	14	14	3
Oct. 24, 1916	18	18	4
June 5, 1917	21	20	7
Sept. 21, 1918	9	6	

SEAPLANES.

Aug. 5, 1914	6	6	2
Nov. 24, 1915	147	96	83
May 31, 1916	229	152	112
Dec. 27, 1917	508	338	215
Sept. 21, 1918	879	372	306

LANDPLANES.

Aug. 5, 1914	6	6	2
Dec. 27, 1915	65	56	8
Oct. 24, 1916	130	89	54
June 5, 1917	172	97	15
Sept. 21, 1918	360	211	38

NOTE.—The above figures include the training submarines, training airships, test airships, training and practice airplanes, and all airplanes and vessels awaiting acceptance with the exception of "Fernlenk" airplanes.

TABLE IV.—*Losses of the German Navy during the World War.*

Losses in battle up to the end of 1914:
- 2 old large cruisers.
- 9 small cruisers.
- 9 torpedo boats.
- 1 mine ship.
- 5 submarines.
- 15 other vessels.

Losses through mines, accidents, etc., up to the end of 1914:
- 2 old large cruisers.
- 1 small cruiser.
- 5 torpedo boats.
- 1 mine sweeping vessel.
- 4 other vessels.

Losses in battle up to the end of 1915:
- 2 old large cruisers.
- 3 small cruisers.
- 8 torpedo boats.
- 2 mine ships.
- 4 airships.
- 17 submarines.
- 14 other vessels.

Losses through mines, accidents, etc., up to the end of 1915:
- 8 torpedo boats.
- 10 mine training ships.
- 7 airships.
- 2 submarines.
- 6 other vessels.

Losses in battle up to the end of 1916:
- 1 battle cruiser.
- 1 old line ship.
- 4 small cruisers.
- 13 torpedo boats.
- 9 airships.
- 21 submarines.
- 4 other vessels.

Losses through mines, accidents, etc., up to the end of 1916:
- 5 torpedo boats.
- 9 mine training ships.
- 7 airships.
- 1 submarine.
- 6 other vessels.

Losses in battle up to the end of 1917:
- 9 torpedo boats.
- 10 airships.
- 61 submarines.
- 10 other vessels.

Losses through mines, accidents, etc., up to the end of 1917:
- 9 torpedo boats.
- 26 mine training vessels.
- 5 airships.
- 6 submarines.
- 27 other vessels.

Losses in battle up to the end of November, 1918:

1 small cruiser.
3 torpedo boats.
2 airships.
64 submarines.
4 other vessels.

Losses through mines, accidents, etc., up to the end of 1918:

29 torpedo boats.
25 mine training vessels.
11 airships.
17 submarines.
38 other vessels.

Total losses:

1 battle cruiser (*Lutzow*).
1 old line ship (*Pommern*).
6 old large cruisers (*Scharnhorst, Gneisenau, Blucher, Prinz Adalbert, Yorck, Friedrich Carl*).
18 small cruisers (*Magdeburg, Mainz, Hela, Emden, Nurnberg, Undine, Wiesbaden, Rostock, Breslau, Ariadne, Coln, Konigsberg, Leipzig, Dresden, Bremen, Elbing, Frauenlob, Karlsruhe*).
98 torpedo boats.
3 mine ships.
71 mine training ships.
55 airships.
194 submarines.
128 other vessels.

○

OFFICE OF NAVAL INTELLIGENCE
NAVY DEPARTMENT
Washington, D. C.

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MAY 20 1924
ARMY WAR COLLEGE

MONTHLY INFORMATION BULLETIN

NUMBER 5—1924

MAY, 1924

DISTRIBUTION

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines

WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

CONFIDENTIAL

OFFICE OF NAVAL INTELLIGENCE

MONTHLY INFORMATION BULLETIN

NUMBER 5—1924—MAY, 1924

FOR CONVENIENCE IN ROUTING

Officer	Initials	Date received	Date forwarded
Captain			
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First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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H. I. J. M. S. *Mine Sweeper No. 2.* (New type, completed 1924)

GREAT BRITAIN

PRESENT SHIPBUILDING PROGRAM

March, 1924

The estimated costs given last year have all been revised upward.

Estimates covering expenditures in 1924–25 apply to—

	To complete	To advance	To commence
Battleships		2	
Cruisers	3	1	5
Leaders	2		
Destroyers			2
Submarines	5	2	
Mine layers		1	
Carriers	2		
Total	12	6	7

Total number of vessels, 25.

The *Nelson* and *Rodney* battleships had spent on them to March 31, 1923, £431,958 and £349,168, and during the year ending March 31, 1924, the probable expenditures will be £1,278,599 and £1,142,960. (Progress in last year was slow on account of the boiler makers' strike and other industrial unrest. Also funds were said to be inadequate.) Next year a somewhat greater rate of expenditure is expected. The 1925 estimates are £1,377,043 and £1,427,540.

The cruisers *Effingham*, *Frobisher*, and *Emerald* will complete in 1924–25 but the *Enterprise* will be delayed until 1925–26. For the *Enterprise* £151,371 only is estimated for this year with £5,486 to complete. All of these cruisers have taken an unreasonably long time to complete.

The flotilla leaders *Broke* and *Keppel* will complete in 1924–25.

The seven submarines of the "war emergency program" *K26*, *L23–26–27–53–54–69* are apparently well advanced. The estimated cost is £2,149,982 for the lot of which £1,919,577 is spent to date with two boats (*K26* and *L69*) complete; £143,696 is to be spent in 1924, when four boats complete and £86,712 in 1925–26 when the remaining boats should complete.

The *X1* submarine is practically finished and is expected to complete in 1924–25 with only £15,585 expenditure. Rumors of failure

to meet her designed speed are current, but evidently no extensive changes in engines are contemplated in view of this estimate.

The estimate for 1923–24 contained £8,104 for laying down a "new submarine." This submarine can now be identified in this year's estimates as the *O1*, 1,480–1,750 tons, building at Chatham, on which £23,632 was spent this year and for which the estimate gives £214,228 for 1924–25.

With five submarines completing in 1924–25 there will be but the *O1*, and one *L* type still building in 1925–26.

The aircraft carriers *Eagle* and *Hermes* are practically complete and have had trials. The estimates allow each £21,041 to finish in 1924–25. This is understood to cover deck alterations for handling aircraft and some fire-control changes.

The new section for the ex-German floating dock building at Armstrongs will require £192,751 in 1924–25 and thereafter £15,780 to complete in 1925–26. The estimated cost was £406,225 of which £197,694 is spent to date.

The five new 10,000-ton cruisers to be laid down this year (if approved by Parliament) are given no total estimated cost but an amount varying from £277,090 to £396,617 each is estimated to be spent in 1924–25. Newspapers estimates of total cost are about £1,750,000 each.

The mine layer *Adventure* is to be launched in Devonport in June. No estimate of total cost is published but £404,347 has been spent to date and £323,236 estimated for next year.

An estimate of £147,848 is submitted to lay down "two torpedo-boat destroyers." No details are given.

GREAT BRITAIN

ROYAL NAVAL COLLEGE, GREENWICH

April, 1924

The Royal Naval College, Greenwich, is situated on the banks of the Thames, in the Borough of Greenwich, about 5 miles east of Trafalgar Square.

The building consists of four blocks, built as a Royal Palace; it was assigned in unfinished state as a hospital for seamen under the name of Greenwich Hopital, and in 1873 became the Royal Naval College. The plan at that time was to make it a naval university. However, many of the important educational courses for officers are now conducted at Portsmouth.

The buildings are very massive and possess considerable architectural merit. The location so close to the center of London is

considered to have all the advantages of being so close to the center of affairs of the British Empire, and likewise the disadvantages to concentration of the students upon their work. It seems to be the general opinion that the naval war college and the staff college should be transferred to the Army war college at Camberley, and it is only the difficulty of obtaining the necessary funds that prevents this being carried out now.

The Royal Naval College, Greenwich, now comprises the following educational establishments:

(1) The college proper, where are held the theoretical courses for officers specializing in engineering, gunnery, torpedo, advanced wireless telegraphy, and antisubmarine duties, as well as the theoretical training for sublieutenants, mates, assistant naval constructors, and instructor officers.

(2) The war college for senior officers, which before the war was a separate establishment under a flag officer at Portsmouth.

(3) The staff college, for training selected officers in staff duties, which had been projected before the war but not actually established.

(4) The naval medical school, which was founded shortly before the war.

The staff of the Royal Naval College, Greenwich, is shown on pages 1865 and 1866, British navy list, March, 1924. The names and ranks of the officers attending the various courses are shown on pages 1112–1119.

As indicated on page 1866 of the British navy list, the gyro research laboratories are also located at Greenwich, with a large scientific civilian staff. This appears to be under the direction of the controller's office.

ROYAL NAVAL COLLEGE (PROPER)

The Royal Naval College proper does not correspond to any part of the educational system of the United States Navy. As indicated above, in some ways it performs the same functions as our postgraduate courses, but it has a larger function in that practically all sublieutenants go through the prescribed courses there prior to their promotion to lieutenant, and the proficiency shown during the course takes the place of the examination for promotion in our service.

The college proper has largely increased in its activities since before the war for the following reasons:

(*a*) The adoption of the new scheme of training in 1902 with a reduced age of entry involved an interruption for some years in the sequence of officers going up for courses; consequently there was a period of several years during which much of the teaching work at Greenwich was suspended. The number of officers under instruction dropped between 1904 and 1914 to about 50 per cent of the

normal and had only partly recovered in 1914. It has now become normal (about 250 officers).

(*b*) The scope of theoretical training of naval officers has of necessity been considerably extended owing to the much more extensive and complicated equipment of warships, which requires a greater degree of specialized and scientific knowledge in order to maintain and use the equipment efficiently.

The following courses are taken at Greenwich in addition to the courses at the war and staff colleges and the medical school:

NOTE.—In the following table E indicates Electrical; G, Gunnery; T, Torpedo; S, Signal; A/S, Anti-submarine; †, Advanced course.

Course	Duration	Subjects taken [1]
Naval constructors and private students of naval architecture, first year	3 years	1, 2, 3, 4, 6, 9.
Naval constructors and private students of naval architecture, second year		1, 2, 4, 6, 7, 9.
Naval constructors and private students of naval architecture, third year		1, 2, 3, 4, 6, 7, 9.
Electrical scholar	3 years	1, 2, 3, 4, 6, 9.
Lieutenants qualifying for E †	2 years	1, 2, 3, 4, 6, 7.
Lieutenants qualifying for G †	6 months	1, 2, 3, 4, 7.
Lieutenants qualifying for T †	do	1, 2, 3, 4.
Lieutenants qualifying for S †	do	1, 2, 3.
Lieutenants qualifying for E	do	1, 2, 3, 4, 6, 7.
Lieutenants qualifying for G	9 months	1, 2, 3, 4, 7.
Lieutenants qualifying for T	do	1, 2, 3, 4, 7.
Lieutenants qualifying for A/S	6 months	1, 2, 3.
Probationary instructor lieutenants	do	2, 3, 4, 5.
Probationary second lieutenants, Royal Marines	do	1, 2, 3, 4, 9.
Lieutenants, Royal Marines, promoted from warrant rank	do	1, 2, 3.
Mates (general service)	3 months	1, 5.
Acting mates (E)	9 months	1, 2, 3, 4, 6, 7.
Sublieutenants, Royal Navy and Royal Air Navy	6 months	1, 2, 3, 4, 8, 9, 10.

[1] SUBJECTS

1. Mathematics.
2. Applied mechanics.
3. Physics.
4. Chemistry.
5. Navigation.
6. Marine engineering.
7. Machine construction and design.
8. History and English.
9. French.
10. War course.

SYLLABUS FOR ACTING TEMPORARY INSTRUCTOR LIEUTANANTS QUALIFYING FOR TEMPORARY INSTRUCTOR LIEUTENANT

(To be revised at the end of each session)

DURATION OF COURSE, TWO TERMS

The subjects of study, the number of periods per week devoted to each subject, and the marks at the final examination are as follows:

Subject	Periods per week		Marks
	First term	Second term	
Theoretical navigation	11	8	300
Practical navigation			350
Use of instruments			100
Compass, tides, and meteorology		3	250
Applied mechanics	4	6	400
Laboratory work			50
Physics	2	2	300
Physics laboratory work	2	2	150
Chemistry	2	2	100
Chemistry laboratory work	2		50
Ship construction	1		
Marine engineering		1	
History	1	1	
Total for Greenwich course			2,000

The Royal Naval College is quite distinct from the naval war college, staff college, and medical school, but is placed under the same flag officer commanding for reasons of economy. The head of the Royal Naval College at present is the senior instructor captain of the Royal Navy.

The policy of centralizing the higher educational work of the navy at Greenwich has necessarily increased the overhead charges of the college. The addition of the war college and staff college has meant an increase of about 25 per cent in the extent of the accommodation used for educational purposes. This increased space has been obtained by weeding out and thus restricting the space formerly devoted to the Greenwich Museum and by taking in portions of the buildings formerly used as official quarters for various officers. On the other hand, there have been important economies secured which are not evident from a mere comparison of vote 5 at the present time and before the war. Thus the cost of the war college at Portsmouth, and of a separate admiral and staff, which was charged to vote 1, has been saved. (Vote 1 and vote 5 refer to naval estimates.)

The administrative staff of the Royal Naval College consists of the following:

1 vice admiral as president in charge of the whole establishment.
1 captain for disciplinary and executive business of the college, and in charge of the war course for junior officers.
1 commander to assist the above.
1 civilian secretary, 1 clerk, 1 typist for the president's office.
1 medical officer.
1 naval accountant officer as cashier, storekeeper, and librarian.
2 pensioner clerks, 1 civilian clerk for the cashier's office.
1 electrical station engineer for charge of the electric lighting installation, etc.

Making a total of 12.

The college proper has the following teaching staff, in addition to a few visiting lecturers:

7 professors of mathematics, applied mechanics, physics, chemistry, navigation and nautical astronomy, marine engineering, history, and English.
4 assistant professors (mathematics (2), applied mechanics and marine engineering (2)).
14 lecturers (mathematics (4), applied mechanics (2), physics (4), chemistry (2), naval architecture (1), history and English (1)).
7 naval instructor officers (applied mechanics (2), navigation (4), physics (1)).

2 demonstrators for applied mechanics and physics laboratories.
1 marine officer for charge of instruction of probationary marine officers.
1 physical training instructor.
14 laboratory attendants and boys.
1 clerk attached to professor acting as dean of the college.
Making a total of 51.

The normal rates of salary for professors are £500 to £700 a year, with bonus for those who are pensionable under the superannuation acts; or £850 to £1,000 without bonus for those who are subject to the universities' superannuation scheme. Assistant professors as a rule receive £650 to £800 without bonus; lecturers, £400 to £600 without bonus; demonstrators, £250 to £350 without bonus. Naval instructor officers receive the pay and allowances of their rank.

The teaching staff is undoubtedly larger than it was 20 years ago, for an almost similar number of officers under instruction. This is chiefly because of the much larger number of different classes, due partly to the greater range of subjects dealt with, partly to the more advanced instruction, and partly to the breaking up of the large classes of sublieutenants into classes of smaller numbers in accordance with modern ideas of educational organization. These points may be illustrated by mentioning that in 1904–5 when about 250 officers were under instruction, there were 15 classes at the college, made up of 4 classes of sublieutenants and 11 classes doing specialist courses. In 1913–14 there were only 11 classes all told. In the present year there are 25 classes, made up of 6 classes of sublieutenants and 19 other classes doing different specialist courses. In 1904–5 the instruction in applied mechanics only required 2 instructors and there was no laboratory work; there are now 3 laboratories and laboratory work has become an essential part of the curriculum of all students, including sublieutenants. When the sublieutenants devoted most of their time to navigation and mathematics and had no laboratory work, it was the practice, although it was not an efficient method, to deal with them in large classes of from 30 to 40. Now they are divided into classes of 20 or slightly less and even these classes are somewhat large to handle efficiently according to modern educational ideals.

NAVAL WAR COLLEGE

The staff of the naval war college consists of 4 captains, Royal Navy, and in addition a lump sum of £450 is allowed for lectures by outside experts. The officers taking this course consist of captains,

Royal Navy; captains, Royal Naval Reserve, and Royal Marine, Army, and Royal Air Force officers of corresponding rank.

The college was intended to deal with 2 classes of roughly 20 officers during the year, but owing to the many movements of personnel resulting from the naval reductions, the present class consists of 14.

The number of officers required for instructional purposes obviously depends more on the extent of the syllabus, type of subjects, and the methods of instruction than on the numbers under instruction at one time. The subjects of study are numerous and of a very special character, requiring a large amount of private study on the part of the instructors. For this reason and also in view of the fact that with officers of the age and rank of those taking the course the methods of instruction can not be the same as might be adopted in the case of younger students, it has not been possible to reduce the instructional staff below 4 in spite of the temporary fall-off in the numbers taking the course.

The syllabus of the senior officers' war course is contained in a publication which is marked "Not to pass out of the hands of British naval officers."

All captains take the senior officers' war course and recently several rear admirals have been ordered to take this course and also the war staff course.

During a recent visit to Greenwich, visitors were not invited to be present during the discussions and lectures that were being held. But in the course of conversation with the president, the following interesting information was elicited:

The tactical manœuver board is little used except for small forces, as it is found that the officers lose interest after a time, but particular attention is paid to exercises that will simulate the work in plotting room and conning tower, showing the positions of vessels during an action. Evidently much time and attention are given to what corresponds to our "Estimate of the situation" for strategic problems. Considerable time is spent in lectures, followed by discussions; and these discussions are regarded as rather more valuable than the lectures. International law lectures are apparently carried on in much the same way as at our naval war college.

The function of the naval war college in regard to the preparation of war plans is entirely academic, the war plans being prepared in the war plans division of the admiralty.

There are a number of officers taking the senior officers' war course that are not shown in the navy list. These include, normally, two officers from the Army and two from the Air Force. Similarly, two officers from the Navy are assigned to the senior officers' course at the Army school, Woking; two to the Air Force college at Andover;

and two others to the military college at Camberley. There appear to be many advocates of having a combined staff college for Navy, Army, and air officers.

WAR STAFF COLLEGE.

The staff of this section consists of:

1 captain, Royal Navy, as director.
1 captain, Royal Navy, as deputy director.
1 captain, Royal Navy, as assistant director.
5 commanders and 1 Royal Marine officer forming part of the instructional staff.
1 major, Royal Marines, for charge of instruction in intelligence duties.
1 lieutenant commander as librarian.
1 pensioner clerk to assist the librarian.
12 clerks and typists.
3 draftsmen.
Total, 27.

The number of officers taking the war staff course is 26, and this is expected to be about the average number. The number of officers taking the intelligence course is 14.

At the war staff college there are apparently a great number of different courses, including intelligence course, trade course, antisubmarine course, and other technical courses, which cooperate closely with the practical courses held at Portsmouth. and the practical work carried out at Portland.

The wide range in the ranks of officers taking the intelligence course may be noted from consulting page 1112, British Navy List, March, 1924.

The trade course is closely associated with the functions of the trade division of the admiralty, whose work shows the influence of Singapore upon British trade.

NAVAL MEDICAL SCHOOL

The staff provided for consists of:—

2 professors (bacteriology and clinical pathology, and hygiene).
1 demonstrator.
1 pensioner clerk.
6 laboratory assistants.
Total, 10.

The number of officers taking the course at present is 13 and the average number will probably be about 15.

WAGES STAFF FOR THE WHOLE ESTABLISHMENT

The number provided for is 183, as against 243 borne last year. The chief constituents in this total are the kitchen and the mess staff and the servants allowed for attending on the officers and looking after their rooms. The kitchen and mess staff numbers 55, and the staff of officers' servants is at present 109 but is in course of reduction to 65.

GREAT BRITAIN

SOME INTERESTING FEATURES OF AIRCRAFT CARRIER DESIGN

An opportunity was had to discuss the aerodynamic features of aircraft carriers with a well-informed source. The opinions may not in every case represent official admiralty or air ministry policy but are worthy of consideration in view of the great experience of informant.

"*Island*" *type* (*Hermes*).—The "Island" arrangement has in the case of the *Hermes* proved extremely convenient for the installation of fire control, searchlight, navigating, and radio locations. The size of the *Hermes* island grew unreasonably during the design stages because of the demands of various people for full view locations. The final straw was a demand from the air ministry for a separate aeroplane control and signal position for the flight officer. This is to be used to direct flight operations as well as flying on and off. The other source of controversy was with the engineers in an effort to cut down the cross sectional area of the smoke pipe. The speed of uptake gases can easily be doubled or trebled but it is not generally practicable to obtain the greater speed of gases (through smaller funnels) by increasing the air pressure of the closed boiler room. In the *Hermes* something was done along this line, but speeding up of air for combustion is not practicable with small tube boilers which are already forced at about as high a rate as they can stand. The installation of exhanst blowers in the uptake is being considered for new aircraft carrier designs. The exhaust blower is considered to be necessary to cut down the size of uptakes and funnels.

Some responsible officers consider that the proper aircraft doctrine is to treat the aircraft carrier as an independent unit with her cruiser and destroyer screen. The carrier is a part of the fleet but a part of no formation. She is free to change course as desired. According to this view, the carrier need not be well gunned, no torpedoes are wanted, and radio need not be powerful. The gun power and radio (long range) are best placed on the cruisers;

the torpedoes on the destroyers. Under this view, the island of the carrier might be made relatively rudimentary, and consist of a bridge, funnel and mast only. Admiralty opinion is, however, still officially in favor of a good anticruiser battery of guns. The gunnery people insist that guns are useless without modern fire-control arrangements.

The *Hermes* is unfavorably criticized due to overcrowding. The Admiralty plans originally called for something over 300 men as complement. As the design grew, the complement grew and when the air ministry took over aviation the complement was again boosted to provide for air personnel who would have no ship's duties. The total is now 568. It is claimed that if the Navy had full control more than 100 men could be dispensed with. As it is, it became necessary to alter the design while the ship was building, to work in another deck to give more living space. This was done at the expense of deck height, which was reduced over a large part of the ship to 6 feet (less than this under beams). Habitability is now not good.

The island of the *Hermes* is somewhat too large and in particular is much too long. The disturbance set up by the island is not especially serious, but there is always a turbulent wake of air which makes deck landings difficult. The most serious objection found is that a pilot failing to make a landing must turn away from the island to get clear to make another attempt. On recent trials, 30 miles at sea, westerly wind, it was found that the wind direction varied 10° on either side within a second's time. This was in somewhat unsettled weather but not suspected as being unfavorable to flying. The effect of the constant shifting of wind was to cause a rising wind across the deck—that is, the wind was rising from the windward side. When the airplane leveled off to make a landing on deck, the wind shifted and lifted his windward wing tip suddenly. Under these conditions, the pilot has no alternative but to turn to leeward and dive over the side, picking up speed and control. When an airplane is heeled over it is bound to turn regardless of the pilot's wishes.

Under the conditions described above, the island proved to be a serious and dangerous obstruction. If the wind gust comes on the port side, the plane turns toward the island side and will collide with it. A serious accident to the test pilot was narrowly averted. He had kept his power on and was able (in a light plane) to turn just aft of the island. A slower pilot, a heavier plane, or a plane with dead engine would surely have hit the island.

A great deal of recent air ministry objection to the island and the decision to omit the island on the rebuilt *Furious* is based on this danger of collision.

The wake or turbulent air in rear of the island has been found by experiments both in the wind tunnel and full scale, to expand with a half angle of cone of some 7 or 8°—say in a 15° cone. The result is that the wake spreads over the deck and at the stern extends right across the ship. This wake is turbulent and of lower velocity than the general wind. It is important to keep the island as low as possible in order that this wake may not be entered by the airplane until ready to drop into the arresting gear. The effect of entering the wake is an apparent loss of lift. Measurement of velocity and direction of wind in the wake have not proved useful. What is of more interest is to explore the limits of the wake and so to locate its usual positions. A skillful pilot knowing the location of the wake becomes used to it and is able to counteract its effect on his plane. He expects to hit the wake at a definite place.

Wind tunnel measurements of the wake due to the island are complicated by the more general disturbance due to the above water form of the hull itself. In general, the island wake influence is most marked over the deck but falls away and is merged into the general disturbance due to the ship, as measurements are taken aft of the ship. The most important region to explore is some 100 to 200 feet aft of the stern along the gliding path followed by a plane approaching a landing. The disturbance of the air in this region is largely due to the form of the hull itself, especially if not pointed into the wind.

Exploration of wind structure by means of short silk threads (as was done at the Washington Navy Yard for the *Lexington*) had been tried and abandoned as inconclusive. The threads flutter about, due to their own elasticity. The degree of flutter depends less on the wind structure than on the length and weight of silk used. The photographic record of silk threads is not very useful, as the photograph appearance depends too much on the period of exposure used. The results in any case are only qualitative and comparative.

More useful results have been had by direct quantitative measurements of velocity and direction over the region to be explored. For this a double or Y-shaped pitot headed yaw meter is used. Inside the turbulent wake of the island and anywhere within some 6 feet of the deck or side, the yaw meter readings are useful only to indicate fluctuations due to turbulence and the boundary of the steady air stream. Mapping the boundary of the stream is considered of first importance. The wind tunnel results have been checked aboard ship by similar measurements, using a pitot yaw meter mounted on a long pole. Conditions were found less steady at sea, due to variations in the natural wind not present in the wind tunnel.

With an island on the starboard side, the wind can be brought 5 or 10° on the port bow. In this case the wake of the island lies over the starboard side, but still expands enough to reach over the stern. This position was found by experience to be less advantageous for deck landing than with the wind dead ahead. The trouble came from the disturbance set up by the unsymmetrical attitude of the ship's hull. The wind banked up on the port side, poured over the deck, and descended over the starboard quarter. There was a velocity gradient of some 5° slope across the arresting gear space. The air astern of the ship was found to be disturbed also.

On the whole the best position for the ship, with or without island, is dead in the wind. A variation of 5° to either side should not be exceeded.

The island has had an unexpected advantage in that a pilot is better able to judge his height and distance when making a landing. Landings on the flush deck vessel are somewhat less certain in this respect, but, of course, the need for great precision is less for flush deck ships.

The air flow over the deck of a ship, with or without island, is turbulent near the deck, but this is not of first importance. However, if the ship is trimmed too much by the stern, the flow may be bad. The deck forward should, by preference, slope down toward the bow or curve down easily. If this is done, some trim by the stern can be tolerated. The stern should be clean to allow the air to flow away from it without producing a large suction and causing something like a waterfall at the deck edge at stern.

The reported decision to convert the *Furious* to a flush-deck vessel is confirmed. As a flush-deck vessel, danger of hitting the island is eliminated as well as the wake due to the island, but the disturbance of the air due to the ship itself will remain. This latter disturbance is the most severe one and, as stated above, arises largely from yawing out of the wind.

No information as to smoke arrangements, battery, etc., on the *Furious* can be given now, but it is safe to say final decision has not been made. However, the following scheme has been proposed by a responsible man and rejected on the ground of requiring too much cutting of the web of the ship's girder. It is possible that the scheme may be considered again and something like it used.

The boiler uptakes meet in a stack on the center line as in an ordinary vessel. This short stack empties into the middle of a transverse pipe with venturi throat at center. When the wind is not ahead, the smoke pours out the lee side, assisted by the venturi throat suction due to the wind. An exhaust blower may be used to keep down pipe sizes at the expense of gas velocity. The trans-

verse smoke pipe is just under the flying deck. The ends are fitted with 20-foot telescopic horizontal funnels which are drawn in for docking.

It is claimed that this scheme permits the lowest complete wind-tunnel deck to be worked well above the water line ("bulkhead deck") so that side longitudinal wind-tunnel bulkheads may extend high enough to give protection against a flooded boiler room if ship is heeled due to a holed side.

The same general idea is indicated in a paper by Sir Tennyson D'Eyncourt in the Institution of Naval Architects for 1923, entitled an "Aircraft Carrying Mail Steamer." There the boiler room was right aft and the transverse internal smoke pipe was not given telescopic outboard extensions. The scheme is, in general, similar. The advantages of having the boiler room right aft are very great, but can not be realized in existing ships such as the *Furious* class.

The objections raised to the transverse smoke pipe are two: First, it cuts the strength of the ship at side (web of girder), and, second, the smoke will be sucked along the side of the ship and cling about the stern. Informant thinks both objections can be overcome by careful design.

GREAT BRITAIN

WORKS OF THE FAIREY AVIATION CO.

March, 1924

A visit was recently made to the works of the Fairey Aviation Co. That plant is located at Hayes, Middlesex, 11 miles west of London, and on the Great Western Railway. Most of the buildings were erected during the war; are of modern construction and well arranged. Thirteen hundred men are employed at the present time, of which 51 comprise the technical staff. The plant is operating at practically full capacity and is principally engaged in the construction of Fairey *Fawns* and *Flycatchers*. The *Fawn* has been considerably modified, and the present model is a great improvement over the one seen at Martlesham. The capacity of the plant is stated to be approximately 6 *Fawns* per week or 8 *Flycatchers* per week. It was learned that 49 *Fawns* have been completed and delivered since January 1, which would indicate that this type has been adopted as a standard reconnaissance airplane.

The *Fawn*, as now being built, is a three-seater, corps reconnaissance type tractor with Napier "Lion" engine. The pilot occupies the forward seat, a gunner-bomber the middle seat, and the third seat is for use in case a special observer is carried. Arrangements

are made for the mounting of a camera in either the second or third cockpit. The seat in the middle cockpit folds down in the bottom so that this man, acting as bomber, can take a prone position in the bottom of that cockpit. One Vickers gun with Constantinesco gear is mounted on the left side forward of the pilot's seat, and the middle cockpit has a scarf ring mount, but it is not known whether this mount carries a single or double gun, as no gun was installed nor were any bomb sights. The tail of the *Fawn* is considerably longer in the new design and the surfaces have been slightly changed to give better control. Fuel is carried in two tanks mounted on top of the upper wing and shaped like an extra thick wing section, the front ends of the tanks projecting over the leading edge. These tanks each hold 75 imperial gallons. The plane in a general way follows normal methods of design and construction, the fuselage being rectangular in cross section, tapering to the vertical. Both fuselage and wings are of wood, except that the center section is built of steel tubing with wooden ribs, and the forward part of the fuselage is built of steel in two sections. The first forward of the pilot is rectangular in cross section, except with the bottom sloping upward and pinning to the fuselage proper, and the forward or engine bearer section is also rectangular and has a steep sloping bottom pinning to the intermediate section. It was noted that these two sections were erected on jigs, and it was further noted that there had apparently been a great effort made to standardize fittings, simplify construction, and to make parts of different planes interchangeable. The radiator was mounted below the engine in a sloping backward position and was fitted with stream line duralumin shutters. The oil tank was mounted under the after end of the engine, and had a capacity of 9 gallons. No figures regarding performance could be obtained, other than that the plane had a cruising radius of 8 hours and was designed primarily for high-altitude work. The undercarriage was fitted with Oleo shock absorbers with a throw of 13 inches. The tail skid was fitted with compression rubber shock absorbers and was so rigged as to permit a slight deflection on either side, this deflection being also controlled by compression rubber shock absorbers.

The Fairey *Flycatcher*, so far as could be observed, has not been materially modified. In connection with previous comment, while discussing the *Flycatcher* as to the possibility of a strong tendency for the plane to nose over after engaging on deck landing, a telephone conversation was overheard while sitting in the office of the company, which was very interesting. Some one was phoning from the air ministry in regard to repairs to Faireys attached to the *Hermes*, which ship, it was gathered from the conversation, was up off the east coast of Scotland undergoing tests. It appeared, from

hearing one side of the conversation, that the *Flycatcher* was the standard equipment of the *Hermes* and that four of these planes had been damaged recently by nosing over. Considerable damage had apparently been caused by severe blows on the tail skids when landing, these blows resulting in the fracture of some part of the structure of the fuselage. A request was made by the air ministry for the Fairey Co. to get out a new design of tail skid with better shock-absorbing arrangements. The present design uses steel springs under tension instead of compression rubber.

The *Flycatcher* with amphibian rigging was carefully inspected. Several of these planes were in the course of construction, and it was stated that they were very satisfactory. One plane observed under overhaul was stated to have had 160 hours' service, of which 120 were on an airdrome and 40 on a carrier. The airplane itself was identical with the land type except for the undercarriage. It was fitted with two floats of the usual Fairey rather flat botton type. Each of these floats contained a well extending through from top to bottom. The well was approximately 24 inches long and 8 inches wide, except that the bottom portion was narrowed down to approximately 5 inches width. This well contained a wheel mounted on an axle borne in fittings secured on the top of the narrowed portion. The wheel projected about 6½ inches below the bottom of the float and made a loose working fit with the bottom of the well, the forward and after lips of which were shaped to conform to the curvature of the tire. The axle of the wheel was located about 2 feet forward of the step. On the bottom of the float was a thin flexible board approximately 3 feet long. This board was secured to the float with a wedge under the forward end so that when in normal position the after end, which just cleared the tire of the wheel, was 5 inches below the bottom of the float. Extending from the sides of the board to the bottom of the hull was fairly heavy waterproof canvas. The purpose of this board arrangement was to cause cavitation at the wheel position in order to reduce the resistance of the wheel when planing on the water. The step on the float was about 3 inches deep, and the arresting gear hooks were carried on a plate hinged at the angle at the top of the step. This plate had fitted to it a bell-crank arrangement extending into the well and thence up to the top of the float so that the pilot could throw the plate down for the engaging position of the hooks or throw it up flat against the bottom of the float abaft the step at will. The bell-crank arrangement was operated by wires extending over a wheel with crank in the pilot's cockpit down to a wheel on top of the pontoon, which wheel operated a worm which, in turn, operated the bell crank. When in the engaging position the bottom of the arresting gear attachment extended about 2½ inches

below the bottom of the step, and the tops of the slots, of which there were four (two on each side of the center line), were not over a half inch below the bottom of the step. The float appeared to be heavily reinforced inside, immediately around the points where the wheel axle was attached. On the stern of each float was a very heavy but short tail skid rigidly secured to the float. This tail skid was rather flat and extended to the rear in a more or less horizontal position with a slight drop downward. It appeared that there would be frequent damage to the float on account of the strain on this tail skid, but it was stated that so far as was known no float had been seriously damaged from this cause. The stern of the float, which was pointed, was heavily reinforced. The shock of landing was taken up by Oleo shock absorbers. It is obvious from the arrangement that there is a spreading effect of the stern of the float upon landing, but it was stated that this was not sufficient to cause any difficulty.

A curious feature noticed in the construction of all the floats at the Fairey plant was what they called the circular method of interior bracing. Instead of having the usual vertical and diagonal bracing members to transmit strains from the bottom, they had circular or elliptical bracing, these circles or ellipses being tangent to each other, and the spaces above and below, where two large circles or ellipses meet, being filled with similar circles. These bracings were made of ash covered with line tape spirally applied. The Fairey Co: stated that they believed they obtained both strength and flexibility by this method and that it was at least no heavier than the ordinary method of bracing.

There was observed in the course of construction, and about two-thirds complete, a large single engine, twin float seaplane. This seaplane is being built by private arrangement for an attempt to be made to fly around the world. The proposed expedition will be in the charge of a Mr. Tims, a civilian employee of the air ministry. The plane appears to be an expansion of the *3–D* type. It is equipped with one Rolls Royce "Condor," and is said to have a sufficient fuel capacity for radius of 1,450 sea miles at 70 knots. Each pontoon contained two long cylindrical petrol tanks, each having a capacity of 69 gallons. There were to be two large tanks in the fuselage, the capacity of which could not be ascertained. The seaplane was designed to carry five persons and had no unusual features, but its construction looked very sound.

In the course of the conversation, it was stated that the Fairey Co. had received an order to manufacture 60 *3–D* type seaplanes. This is the type now being used in the Mediterranean for naval reconnaissance work, and is a type already well known to the Navy Department.

JAPAN

MISCELLANEOUS NAVAL NOTES

March, 1924

From Japanese Press.

The destroyers *Tsuta* and *Suzuki* of the Fifteenth destroyer division, while en route from Yu-u to Kure, and while engaged in mine sweeping practice near Kabutoshima had out a long line for towing mechanical mines. Suddenly a loud noise was heard in the *Tsuta's* engine room and upon investigation it was found that the tow line was twisted around her port propeller.

Vice Admiral Abo, chief of naval technical department, now visiting Kure Naval Station when interviewed spoke as follows: As regards submarine *No. 70*, she is being reconstructed at Kawasaki dockyard, but owing to the fact that she was under water for about 60 days, and due to the escape of hydrochloric acid from the secondary batteries, the internal parts are almost useless, but since the outer part can be utilized, she will not be scrapped, thus the name *No. 70* will not disappear from the list. As regards the construction of the *Nachi* and *Myoko*, 10,000-ton cruisers, it is likely that the laying down of these two ships will be about October, 1924.

The Nagoya Clock Co. at Nagoya has offered to the navy a piece of ground facing the water front for the purpose of building a wireless station, and the navy will erect on this site a wireless station at an approximate cost of ¥50,000.

The relief that will be felt in Japanese naval circles if the proposal to establish a large British naval base at Singapore is finally dropped was expressed in an interview by the Vice Minister of the Navy, Vice Admiral K. Okada.

The statement which appeared in the Sunday Times to the effect that Great Britain intends to spend no more on the Singapore base, if true, is very welcome news in Japan, the vice minister said.

To speak frankly, no other international issue of recent times has so hurt the feelings of the Japanese people as the British Government's original proposal regarding a naval base at Singapore. Never since Japan opened her ports to world trade has she dreamed of war with England. The very name of Britain has inspired us only with sentiments of warm friendship.

Since its abrogation, we greatly miss the Anglo-Japanese alliance. And now the Singapore business has loomed up to our great surprise. Whatever may be the ultimate end of the matter, it is most unpleasant for us to be compelled to think that our old friend has come to the point of thinking of conflict with us. On our part, we never considered such an eventuality until aroused by the vague challenge the Singapore scheme implied.

If Great Britain finally abandons the Singapore project, the traditional feelings of unsuspecting friendship for her will be restored in Japanese breasts. Such a decision would give the world assurance that Great Britain is pledged to abide by the spirit of the Washington treaties and afford other nations her splendid example.

Great Britain has nothing to fear from Japan. If Britishers will remember what Japan did during the war, they should realize that the expenditure contemplated at Singapore would be only a waste. If Japan had held any ambitions inimical to British interests, the war would have afforded her a rare opportunity to carry them out.

We believe, however, that our relations with Great Britain will continue to be characterized by unwavering friendship.

The training squadron of the Japanese Navy after April will comprise the three warships, *Idzumo*, *Yakumo*, and *Iwate*, and will be commanded by Vice Admiral Furukawa, chief of the naval education bureau of the navy department, who will succeed the present commander, Vice Admiral S. Saito, who will be nominated as chief of the naval board of command.

Although it was originally expected to make a training cruise with the 200 men who will graduate from the naval academy, engineering, and paymaster's schools, in July, the program has been changed to merely making a cruise along the shores of North America covering a period of about six months.

This shortening of the cruise has been made necessary by the reduction of the budget estimates.

The first destroyer division, consisting of the *Tenryu* and the following divisions: Sixteenth division, *No. 10*, *No. 16*, *No. 18;* fifteenth division, *Tsuta*, *Hagi*, *Fuji*, *Susuki;* fourteenth division, *Tanikaze*, *Kawakaze*, *Aoi*, *Kiku;* thirteenth division, *No. 2*, *No. 4*, *No. 6;* and the first submarine flotilla, consisting of the *Chikuma*, *Jingei* and the following divisions: Sixth division, *No. 46*, *No. 47*, *No. 58;* fourth division, *No. 28*, *No. 29*, *No. 30;* will leave Kure on March 5 for a training cruise touching at Sasebo, Saito (Tsingtau), Amoy, Keelung, Amai-Oshima, and Kagoshima.

The first submarine flotilla will not touch at Tsingtau and Amoy, but will go direct from Sasebo to Keelung and will join the destroyer squadron there; the destroyer squadron will leave Keelung on the 26th of March, while the submarine flotilla will leave on the 25th of March. The submarines will go direct to Kagoshima, while the destroyers will go by way of Amami Oshima. They will meet again at Kagoshima.

NOTE.—The records of this office show that destroyer division 13 is composed of destroyers *No. 4*, *No. 6*, and *No. 10;* that division 16 is composed of destroyers *No. 16* and *No. 18*, and that destroyer *No. 2* is in the twenty-eighth division at Sasebo.

The *Kitagami*, flagship of the second destroyer squadron (Rear Admiral N. Iida), the first destroyer division, consisting of the *Nokaze*, *Namikaze*, *Numakaze*, *No. 1;* the second destroyer division, consisting of the *Minekaze*, *Sawakaze*, *Okikaze*, and *Yukaze;* the fourth destroyer division, consisting of the *Akikaze*, *Tachikaze*, *Hakaze*, and *Hokaze;* and the fifth destroyer division, consisting of the *No. 3*, *No. 5*, and *No. 7*, a total of 16 ships, are to go up the Yangtse River for a distance of 600 miles. *Kitagami* will take a band on board from the Sasebo Naval Barracks for the trip, leaving Kure on March 19 and arriving at Shanghai on March 22, will remain there until March 26 for the trip up the river to Hankow via Nanking, Kiukiang, Tayeh, etc., and will return to Sasebo April 15.

The destroyers *Tokitsukaze*, *Amatsukaze*, and *Isokaze* of the eighteenth division, belonging to Kure, will leave Kure on April 8 for the Kurile Islands via Ominato. These destroyers have been assigned to look out after the American round-the-world fliers, who are expected to arrive Shimushu Islands on May 1, leaving there on May 3, and arrive at Etorofu Island on May 5 and then proceed on to the main island of Japan. The destroyers will furnish quarters and other necessary assistance as required by the American aviators.

Destroyer *No. 7* (1,400 tons), which was constructed at Maidzuru, is now undergoing various official trials. She passed the speed trials and on March

3 left Maidzuru for engine trials, and from March 4 to 8 will undergo armament tests. She will be turned over to the navy department the latter part of March and will be assigned to Yokokosuka in early April.

Destroyer *No. 9* was launched at Maidzuru on March 15, 1924. She is 1,400 tons displacement, speed 34 knots, and carries four 12-cm. guns and six torpedo tubes.

It has been decided to build two large type (1,500 tons) submarines for laying mechanical mines. They will carry about 40 mechanical mines each. They will be built at Kawasaki Dockyard, Kobe.

NOTE.—This is the first evidence obtained to indicate the building of mine-layer submarines. When possible, the names of the boats will be obtained and reported.

The submarine tender *Chogei* was launched at Mitsubishi, Nagasaki on March 24, 1924.

The quarters which were under construction in Yoshiwara Machi, just outside of the city of Kure, has been completed and the school will move to its new quarters March 22, 1924.

The old ship, *Itsukushima*, which has heretofore been used as a school, will hereafter be used for quartering the students, and she will be towed to Shingu. One of the old German submarines will be used as a landing pier, connecting the ship with the dock.

With the transfer of the school to new quarters, the new of students will be increased during the fiscal year 1924.

NOTE.—It is intended to request permission to visit this new school sometime this spring.

While engaged in maneuvers off Sasebo Harbor on March 19, 1924, the *Tatsuta* and submarine *No. 43* collided at a point about 10 miles out of Sasebo Harbor, about 3 miles east of Fukuse and the submarine sank. The water depth at the point of the sinking is 26 fathoms, and work of salvaging is now going on. Those on board are: Lieutenant S. Kuwashima, commanding (acting); sublieutenant, first grade, Nakanira; sublieutenant, first grade, Machino; sublieutenant (Eng.) Ichimura, and about 40 others.

NOTE.—No details of the above disaster have been obtained other than the above except that telephone information from the submarine states that the bow of the boat is flooded and that 18 persons were alive in the after compartment.

FURTHER NOTE.—Since writing the above, information has been obtained to the effect that hope of rescue has been abandoned. Effort will be made to drag the boat to shallow water and then raise her. The bow is reported damaged and also the conning tower is slewed to one side.

A fine of 150 yen was recommended by Procurator Higuchi on the occasion of the public trial of Captain Ikeda, captain of the ill-fated submarine *No. 70*, held at the naval court at Kure, March 10. The procurator remarked that, "Although the captain must bear the responsibility for the sinking of the submarine off Kariya Point of Awaji Island, which led to the loss of 88 lives last summer during the submarine's trial run, thereby coming under articles 129 and 213 of the naval criminal code, leniency should be shown in pronouncing judgment, as most of the captain's assistants were inexperienced and because the submarine was over-manned."

The trial by court-martial of the commanding officers of submarines *No. 26* and *No. 70* will begin March 10, 1924. Captain Omoto, the head instructor of the submarine school, will act as the presiding judge.

Lieutenant Ikeda of submarine *No. 70*, and Lieutenant Ogata (Lieutenant Kono, commanding officer of submarine *No. 26* at the time of sinking, having since died, the responsibility falls upon Lieutenant Ogata) will be tried on the charge of sinking the submarines and causing death by their negligence. Since the proceedings will have to do with confidential matters regarding the working of submarines, the attendance at the trial will be limited to certain navy men.

NOTE.—This instance, together with the statement made by the superintending constructor at Kawasaki Dockyard, that even naval officers visiting the dockyard are not allowed to see submarines under construction, indicates the secrecy of Japanese submarine activities.

It is intended to inaugurate a weekly flight between Yokosuka and Kasumigaura with Tokyo as the center, and the navy department is looking for a satisfactory landing and starting field near Shibaura water front, Tokyo. Some of the Navy men wishing to take a ride will be allowed to do so, and later may allow the general public to ride also.

Three naval aviators were seriously hurt, one probably fatally, when a bomb carried for target practice exploded in an airplane as it was leaving the ground at the Kasumigaura naval airdrome March 4, 1924. The pilot of the machine was so badly hurt by the concussion of the explosion and by the resulting crash of the plane that he is not expected to live. Two other aviators, who were working on a nearby plane, were knocked down by flying fragments.

The *S—s No. 3* dirigible belonging to Kasumigaura is to make a flight from Kasumigaura to Sasebo, leaving April 16. This is the first attempt at such a long flight for a dirigible in Japan. While flying she will experiment with wireless and telephone.

The flagship of the sixth submarine division was transferred from the *No. 57* to *No. 46* and that of the fifteenth submarine division from the *No. 22* to *No. 37* on March 1, 1924.

The flag of the foreign service squadron was transferred from the *Ataka* to the *Hira* on March 1, 1924.

JAPAN

NAVAL ACADEMY ENTRANCE EXAMINATIONS AND COURSE OF TRAINING

March, 1924

The following are copies of the entrance examinations to the Japanese naval academy for 1924 and also outline descriptions of the practical and theoretical courses of training.

TIME ALLOWED, TWO HOURS

History.—1. Give brief review of our commerce with foreign countries from the latter part of Ashikaga era to the opening of the country (visit of Commodore Perry).

2. Name four of the notable treaties China concluded with any one of the following countries since the nineteenth centry, giving the cause leading to it and a brief summary of its contents—Japan, England, France.

3. Give the cause of American War of Independence.

4. Write what you know about the following: Magna charta; Tenryui-bune (kind of native junk); Teiseiko.

Geometry.—1. In triangle ABC, AB is shorter than AC. M is the middle point of the line BC. Prove that the angle CAM is less than angle BAM.

2. Prove that in a trapezoid the line connecting the middle points of lines drawn across the corners is half of difference between the upper and lower bases.

3. Divide the given arc in ratio of 3 to 1.

4. In triangle ABC, AB—78, BC—84, CA—90. Give the length of sections of BC as divided by a perpendicular line dropped from A to BC.

5. Prove that the area of regular octagon inscribed in a circle is mean proportional to area of square whose sides are tangent to that circle, and that of a square whose sides are chords to that circle.

6. There are two circles having the same center. Draw a chord on the outer circle so that it will be equally triasected by the inner circle.

TIME ALLOWED, TWO HOURS

Chemistry.—1. For complete combustion of 126 volumes of a gas composing at the rate of 1 volume of hydrogen and 2 volumes of carbon monoxide, how many volumes of air theoretically in equivalent condition as the above gas will be required?

2. Give briefly the simple method of preparing the following:

(*a*) Hydrogen sulphide.
(*b*) Sulphurous anhydride.
(*c*) Nitric acid.

3. Hydrogen, carbon monoxide, and anhydrous carbon are placed in separate containers. Give the methods for detecting them.

4. Explain briefly the following terms:

(*a*) Monobasic acid.
(*b*) Allotropic substance.
(*c*) Catalyzer.

5. Of the following, state which are the reducing agents and which are oxidizing agents:

Carbon, carbon monoxide, anhydrous carbon, nitric acid, sulphurous acid, chlorine.

TIME ALLOWED, THREE HOURS

Algebra.—1. Divide $x^4 + y^4 - 2^4 + 2x^2y^2 + 22^2 - 1$ by $x^2 + y^2 - 2^2 + 1$ and give the quotient, showing every step of the operation.

2. There is a number made up of three figures which can be divided by 5. Sum of the component figures is 17. Again, when those three figures are arranged in reverse order, the number thus formed is greater than the original number by 198. What is the original number?

3. $x^3 - 5x^2 + px + 45$ can be divided by $x + 5$. What is the root of the equation $x^3 - 5x^2 + px + 45 = 0$?

4. $x = \frac{1}{2}$. Work out the following to the third decimal point:

$$\frac{\sqrt{\sqrt{1+x}+\sqrt{1-x}}}{\sqrt{\sqrt{1+x}-\sqrt{1-x}}}$$

5. Of a, b, c, and d, b and c are both larger than a. Show that $a + d$ is greater than $b + c$ when $a \div b = c \div d$.

6. When arranging 1, 2, 3, 4, 5 in manner as this (1), (2, 3), (4, 5, 6), (7, 8, 9, 10), (11, 12, 13, 14, 15). What is the sum of numbers included in the Nth parenthesis?

TIME ALLOWED, TWO HOURS

Physics.—1. There are two pieces of metal. In order to find which has greater specific gravity, what kind of apparatus should be used and how to proceed? What is the procedure when desiring to know which has greater specific gravity, out of a given solid and liquid?

2. Prove that the less the angle of a wedge is, the more effective it is.

3. One hundred grams of a certain liquid is sealed in an iron container weighing 20 grams, and after heating it to 100° C. it was immersed in 300 grams of water at 15° C. when the water registered 16.5° C. What is the specific heat of this liquid? Specific heat of iron is 0.11.

4. It is proposed to propel a bullet utilizing the expansion of air, compressed to 10 atmospheric pressure, to five times its volume. The length of rifle barrel, the part the bullet passed through, is 1 meter, the area of muzzle is half square cm., bullet weighs 2 grams. What will be the speed of bullet as it leaves the muzzle? It is assumed that the average pressure of the air at the initial and last stage is equally exerted on the bullet; also ignoring the resistance between the bullet and barrel.

TIME ALLOWED, TWO HOURS

Geography.—1. Name three countries from which we import most and give three principal items from each.

2. Name independent countries in the world which are not touched by sea, giving two of the principal products of these countries.

3. Name the possessions of the United States in the Pacific Ocean.

4. Write what you know about the following: Rotterdam, Ichang, Halifax, Hobert.

TIME ALLOWED, TWO HOURS

Grammar.—1. Translate the following into English (four Japanese sentences are given for translation).

2. Translate the following words and phrases into English (same as for No. 1).

3. Give plural of the following words: Cargo, foot, compass, reef, salmon, seaman.

4. Correct the following sentences:

(*a*) When did you come back?

(*b*) A hundred miles are not a short distance.

(*c*) Let us make haste lest we should not miss the train.

5. Supply appropriate word in space marked with parenthesis:

(*a*) It is no wonder he ( ) succeed.

(*b*) I could not ( ) laughing at the funny sight.

(*c*) ( ) harder you work, ( ) sooner you will improve.

JAPANESE WRITTEN LANGUAGE AND CHINESE CLASSIC: TIME ALLOWED, TWO HOURS

TRANSLATION OF ENGLISH INTO JAPANESE: TIME ALLOWED, TWO HOURS.

1. A single hour of the day, steadily given to the study of an interesting subject, brings unexpected accumulations of knowledge.

2. M. Claude Anet became passionately devoted to the collection of plants, which filled up his leisure hours, and in pursuit of which he would wander for miles along the countryside without a weary moment.

3. The born mechanic can tell by a difference in sound or vibration, which, although he is conscious of it, he could not describe, when something is not working properly.

4. Attention and application to your business are absolutely necessary to the enjoyment of life. If you give only half your mind to what you are doing, it will cost you twice as much labor.

5. Games give moral as well as physical health, daring and endurance, self-command and good humor—qualities which are not to be found in books, and which no teaching can give.

TRANSLATE FOLLOWING WORDS, INDICATING ACCENT

Government. Demonstration. Authority. Conference. Agreement. Patriotism. Premier. Experience. Candidate. Propaganda.

Courses of study in Japan Naval Academy

FIRST YEAR (31 weeks)

	First term	Second term	Third term	Total
	Hours	*Hours*	*Hours*	*Hours*
Moral	9	10	11	30
Gunnery	32	22	36	90
Seamanship	18	21	26	65
Construction		7	8	15
Engines	8	20	22	50
Foreign languages:				
English	40	60	70	170
Study of French and German in English	10	10	10	30
German	30	50	60	140
French	30	50	60	140
Algebra	20			20
Calculus		20	20	40
Geometry	30	35	35	100
Plane trigonometry	28	12		40
Dynamics	16	24	34	74
Physics	30	30	35	95
Chemistry	16	22	24	62
Total first year	249	283	321	851

SECOND YEAR (34 weeks)

Moral	13	7	10	30
Gunnery	24	20	22	66
Torpedo	26	20	18	64
Seamanship	24	20	20	64
Navigation	36	20	30	86
Engines	30	20	6	56
Electric work			18	18
Foreign languages:				
English	70	50	70	190
Study of German and French in English	15	10	10	35
German	55	40	60	155
French	55	40	60	155
Calculus	25	20	20	65
Spherical trigonometry	12	20	22	54
Dynamics	37	20	27	84
Physics	40	22	23	85
Laboratory work		20	20	40
Chemistry	24	20		44
Total second year	361	279	306	946

THIRD YEAR (34 weeks).

Moral	13	7	10	30
Gunnery	26	18	20	64
Torpedo	39	30	25	94
Seamanship	40	30	26	96
Construction	13	9		22
Navigation	78	58	66	202
Tactics (naval organization)	25	25	20	70
Engines	23	16	16	55
Electrical work	36	35	34	105
Foreign languages:				
English	65	50	75	190
Study of German and French in English	15	10	10	35
German	50	40	65	155
French	50	40	65	155
Total third year	358	278	292	928

Practical training for naval cadets

Drills	Kind	Number of drills		
		First year	Second year	Third year
Gunnery	Rifle company drill	20	20	20
Do	Drill with ships' guns	12	5	2
Do	Loading, aiming and firing		4	2
Do	Revolver target practice		3	3
Do	Rifle target practice	8	8	8
Torpedo	Manipulation of torpedo tubes			4
Seamanship	Boats under oars and sail	24 (18)		
Do	Handling of motor boats		[1] 24 (18)	
Do	Boats under oars in company formation			[2] 24 (18)
Navigation	Signalling	10	5	5
Physical training				
Jujutsu		20 (11)		
Fencing		20 (11)	40 (22)	40 (22)
Bayonet fencing		4 (4)	(4)	(4)
Swimming		14	30	30
Gymnasium		20	20	20
Total number of drills		152	159	163

[1] Includes total number of drills of boats under oars, sailboats, and handling of motor boats for second year.

[2] Includes total number of drills of boats under oars, sailboats, handling of motor boats, and boats under oars in company formation for the third year.

The numbers in parentheses show number of cold endurance drills given before breakfast during the period from the early part of December to the middle of February.

In addition to the above, rifle target practice can be given on Saturday afternoons.

During the first year both "jujutsu" and fencing are given. From the second year the cadets may select either one.

During summer time only swimming is given instead of "jujutsu," fencing, etc.

In addition to that listed above, all cadets are required to take gymnastic exercises shortly after reveille.

An extract from the Imperial Ordnance regarding the naval academy:

Officials.—President: aid to the president; director of studies; instructors; chief discipline officer; discipline officers; chief surgeon; chief pay officer.

Students (seito).—Students are accepted by examination above the age of 16 and below 20 years. Applicants from the enlisted men in the active service, their ages shall be below 23.

Anyone coming under the following are ineligible: Married; one who has been sentenced to imprisonment; bankrupt; bad conduct.

Students' names are placed on the naval list on the day of entrance. The course of study is for three years, but in time of war or other emergency this can be shortened.

Students can not resign of their own volition.

Students coming under the following will be dismissed from school:

Found lacking in ability to become a naval line officer.

Bad conduct, lazy, and failure to improve after being warned.

Showing so poor that there is little prospect of passing examination.

Injured or contracting sickness, unfit for future service.

Special students (senshu-gaksei).—Chief warrant officers who study at naval academy are called special students of naval academy.

Chief warrant officers who have the following qualifications may be appointed by the commander in chief of a naval station where he is serving, by order of the minister of the navy, upon his application, as a special student of the naval academy, in order to give him the necessary training to carry on the required duties as a special line officer later:

1. Of sound physical condition; making excellent showing in practical studies and recognized as possessing intelligence fit for carrying out the required duties as higher naval officer.

2. Having passed the entrance examinations.

The length of course of study for special students will be fixed by the minister of the navy. In time of war or other emergency the commander in chief of a station may excuse the special students from studies.

Extract from the regulations governing the naval academy.

The discipline of the naval academy shall be similar to that in force on board warships.

Summer vacation begins July 25 and ends August 25.

Winter vacation begins December 21 and ends January 9.

Students.—The president, according to the result of the entrance examinations, shall admit the number as directed by the chief of bureau of naval education. Before so doing they shall be subjected to physical examination and oath administered as to their duties in the navy in the future. If they fail to pass the physical examination, or fail to report at the designated time for entrance, the president, with permission of the chief of bureau of naval education, may deny their admittance and take substitutes under the same procedure as above mentioned.

Courses of studies are divided into three years. The school year begins in August and ends in July.

The president shall forward the graduation records of the graduates, attaching his opinions thereto, to the commanding officer of the training squadron or of the training ship designated to take midshipmen for their practical training.

Special students.—The call for the special students is issued by the minister of the navy. The commanding officer of a division, in

accordance with the call above mentioned, and prior to the entrance examinations, shall select such applicants from among chief warrant officers under him who fulfill the conditions named in clause No. 25 of the ordinance relating to naval academy, also the conditions named below, as the candidates for such admission, and prepare two sets of recommendation papers. He shall forward same to the commander in chief of his naval station through his superior—

1. Having served over a year after being promoted to chief warrant officer.

2. Below 25 years of age.

The commander in chief of the naval station shall notify the names and station of the candidates to the president of the naval academy. The latter then prepares the examination papers and sends same to commanding officer directly. The commanding officer gives the examinations on the day set, and forwards the answers back to the president. The president after examining them sends his report on them to the commander in chief of the naval station.

The examinations are held at different places on the same date.

The examination for admittance as special students are as follows:

1. Written examinations—Japanese written language; Chinese classics; mathematics; English into Japanese.

2. Oral examination—miscellaneous questions.

The commander in chief of the station, in accordance with the reports of the president of the naval academy, selects those who passed the first examinations and gives the names to the commanding officer of a division, who then names an examining committee from his subordinates to carry out the above-mentioned examinations.

As a result of these second examinations, a list of candidates for special students is made and this is sent to the commander in chief of the naval station, who in turn forwards a list of all the candidates in his territory to the minister of the navy.

The minister then names a committee to look these lists over, and when a decision is made, it is returned to the commander in chief.

The commander in chief notifies the president as to the names and number of the successful candidates.

The commanding officer of the candidates orders the physical examination for the successful candidates and after which they are sent to the naval academy.

The length of course of studies for the special students is about 11 months.

FRANCE

MORALE OF THE FRENCH AIR SERVICE

During the past year the military and aeronautical press have carried a steadily increasing volume of criticism aimed at both the military and naval air services. This criticism has recently become acute and has been taken up by the general press. The climax of this criticism was reached in the presentation of a "Proposition de Loi," a bill before the Chamber of Deputies, by three deputies—Monsieur Georges Barthélémy, ex pilot; Captain Renè Fonk, leading French ace; and Colonel Girod, ex pilot. The title of this bill is as follows: "A bill intended to provide the military air service with a body of senior officers worthy of it and its high mission." A copy of this "Proposition de Loi" is attached, and a translation of the essential part is as follows:

EXPOSÉ OF MOTIVES

GENTLEMEN: It is a matter of common knowledge and beyond all denial that our military air service is actually directed, commanded, and administered in a proportion of 80 per cent by officers of good intentions certainly, but who do not fly or no longer fly.

Some brilliant exceptions whose names are upon all lips, save the honor of the higher grades of the air service. This single fact demonstrates the possibility of generalizing the example drawing on the incomparable reservoir of energies which the flying personnel affords. The country will not understand the great financial sacrifices which Parliament is ready to make in favor of the air service, if in this air service courage and danger are the appanage of the soldiers and not of the officers.

Our military aviation at present is in the midst of a grave crisis, and our bill has for its purpose to remedy the increasing deterioration in the ranks of our new arm.

The crisis referred to may be defined as follows:

The Chiefs of the Air Service do not fly or no longer fly.

Let us put aside immediately a few exceptions, whom we may call national, since they are so rare, so well known, and so admired. Commandant Vuillemin is the prototype. They are above all discussion.

Pursuit and bombardment aviation are less affected by this malady, and have preserved their traditions from the danger of lethargy so far, but in observation aviation, in the establishments and the various services from the grade of captain on up, this evil is met and tends to become general. From the grade of major and above, this is the rule. This situation, gentlemen, is intolerable, above all since it is aggravated by the fact that the rewards, promotions, and all the factors fall to the office aviators to the detriment of the aviators who fly, as has been the case in the last four years.

The remainder of pages 2 and 3 of this "Proposition de Loi" may be summed up as follows:

The present administration of the military air service being composed of non-flying officers has evaded the laws covering the methods of promotion to be applied for 5 years from 1922, in order to favor the existing administrative personnel to the detriment of the flying personnel.

Page 4 reads as follows:

"PROPOSITION DE LOI."

ARTICLE 1. The dossier of an officer aviator proposed for promotion will include hereafter a copy of his flying services and flying time.

ART. 2. Officers may not be proposed for promotion unless they have passed in the preceding year their half yearly flying test.

ART. 3. In establishing the tables for bestowal of the Legion of Honor aerial services of the officer proposed will be taken into account above all other considerations.

ART. 4. In no case will an officer be permitted to hold an aerial command unless he is in condition to take the air in front of his command upon the airplane in use by his command.

A number of articles have appeared in the press commenting on the deteriorating morale of the air service. The following reasons are given in most of these articles:

(*a*) Lack of technical progress, due to failure to obtain improved types of airplanes, and particularly of improved engines.

(*b*) Lack of spare parts for both airplanes and engines. It is alleged that this lack is so acute that many active units are obliged to use wrecked airplanes as a source of spare parts.

(*c*) Excess war stocks of engines to be used up, delaying technical progress and the expenditure of enormous sums in building obsolete airplanes around these engines.

(*d*) The lack of competent mechanics and the difficulties of training mechanics in the short period of 18 months' service.

(*e*) The transfer of a large number of line officers of high rank to the air service from other arms, resulting in the occupancy of all important air service posts by officers who have little knowledge and less sympathy for the air service.

There is a great deal of truth in all of these allegations. How far the phrase "moral crisis," which is so frequently heard, is justified is purely a matter of opinion, but it is evident that the morale of the air service is not improving and has probably deteriorated since the war. Other reasons not generally mentioned are the following:

(1) The flying pay offered is so inadequate that it offers practically no inducement, particularly to high ranking officers, and therefore practically no flying is done beyond that which is compulsory.

(2) The pay of all grades of the French Army is absolutely inadequate and this condition is accentuated by the steadily increasing cost of living. The standard of living of officers is constantly being lowered and as a result practically all officers are in some measure discouraged. An interesting side light on the economy practiced by air service officers resulted from the new uniform regulations giving air service officers a dark blue uniform. This change has been met

by dyeing old uniforms dark blue, instead of by purchase of new uniforms of the approved color.

(3) The transfer of senior officers not only results in a nonflying control of the air service, but blocks promotion of the junior officers since promotion is within the arm.

How far the decline in morale has spread is not apparent to a foreign observer, but it is sufficient to cause caustic comment among French authorities.

The following is quoted from an article by Colonel Reboul in Le Temps of January 20, 1924:

"Our military aviation is passing through a grave crisis. * * * We do not dispute the importance of the moral factor, but it alone does not explain the malady of languor into which our aviation has fallen. Beyond the moral factor numerous others exist, but they are of a general order. We have not been able to prepare a well-defined program fixing the successive steps for the development of our new arm. Other factors are of a material order: Old airplanes, old engines, insufficient hangars and barracks, incompetent mechanics, and finally there are factors of moral order—the military pilot is worried over his family in case of accident. Although this matter has been considered in Parliament for two years, the remedies proposed up to the present time are insufficient, as the malady becomes worse instead of improving."

CHILE

LONG-DISTANCE FLIGHT OF ARMY PLANES

March, 1924

There has just been completed by the army aviators an airplane flight which for this country is considered a great feat, the flight being from Santiago to Tacna and return.

The purpose of the trip was to explore the summer air conditions of the northern half of Chile, to examine into suitable landing fields, regular and emergency, and to test plane and aviator abilities for what is here considered long-distance flying.

The route of the flight northward was as follows:

	Kilometers
Santiago to La Serena	405
La Serena to Copiapo	300
Copiapo to Baquedano	450
Baquedano to Iquique	350
Iquique to Arica	200
Arica to Tacna	45
Total	[1] 1,750

[1] Approximately 1,000 miles.

The return from Tacna to Santiago was made with stops at Iquique, Antofagasta, Copiapo, La Serena, and Valparaiso—the south route being practically the same as the north, except the slight detour to Valparaiso.

The flight was inaugurated with seven planes, and four completed the entire trip. Three planes were smashed up, no fatalities resulting.

The planes making the flight were:

Name	Type	Pilot	Passenger
(1) "Ferroviario"	Avro	Captain Castro	General Contreras.
(2) "España"	do	Lieutenant Montecinos	Mechanic Abarzúa.
(3) "General Korner"	do	Captain Barahona	Mechanic Contreras.
(4) "Coquimbo"	De Haviland	Lieutenant Sosa	Captain Cruz.
(5) "Tacna"	do	Lieutenant Herrera	Mr. Seabrock.
(6) "Tarapaca"	do	Lieutenant Lagreze	Mechanic Palomo
(7) "Atacama"	do	Lieutenant Arredondo	Mechanic Gonzalez.

All planes are biplanes. These were acquired in 1917 or 1918. Planes (1), (2), (4), and (5) completed the entire trip.

General Contreras is the chief of the Chilean army air service.

Mr. Seabrock is a civilian working under contract in the army air service, as chief inspector and repairer of army planes.

The flight northward was commenced, and the dates and times of the various steps are as follows:

Steps	Date	Time	
		Hours	Minutes
Santiago-La Serena	16 Feb.	3	50
Serena-Copiapó	18 Feb.	3	5
Copiapó-Baquedano	19 Feb.	4	15
Baquedano-Iquique	20 Feb.	3	15
Iquique-Arica	21 Feb.	1	55
Arica-Tacna	22 Feb.	.....	30

Elapsed time, 6 days.

The southern trip was not made in the time that was taken up for the northern flight, due in some instances to bad weather conditions encountered, but mostly to entertainments for the chief of the air service and the aviators.

Steps	Date	Time	
		Hours	Minutes
Tacna-Iquique	25 Feb.	2	15
Iquique-Antofagasta	29 Feb.	2	55
Antofagasta-Copiapó	6 Mar.	3	40
Copiapó-Serena	8 Mar.	3	10
Serena-Valparaiso	11 Mar.	3	10
Valparaiso-Santiago	15 Mar.	1	.....

Elapsed time, 19 days.

Weather conditions were in general favorable, though on certain of the steps strong winds and some fog were encountered. It was understood, however, that no step would be undertaken if the weather was not favorable.

The first plane to drop out of the flight was the "Atacama," pilot Lieutenant Arredondo. Due to faulty magneto while on the first step, Santiago-Serena, the machine was compelled to land at Cabildo. Although repair parts were furnished, this plane got no farther north than Copiapó, where it was directed to remain, awaiting the return of the other machines from the north, at which time it continued south to Valparaiso in company. On the date set for the Valparaiso-Santiago step, the "Atacama" on taking the air unfortunately struck a eucalyptus tree, breaking a wing and causing machine to fall to earth, which completely smashed up the plane. The pilot and mechanic were only slightly bruised.

The second plane to drop out was the "General Korner," Captain Barahona, pilot, on the Baquedano-Iquique step. Due to engine and propeller failure, landing was forced in an unfavorable place in nitrate fields because of which the machine overturned and the wings were destroyed. Pilot and mechanic were not harmed.

The third plane to have an accident was the "Tarapaca," pilot Lieutenant Lagreze, on the south step, Antofagasta-Copiapó. Due to engine trouble, landing was forced near Alto de Mina on ground unfavorable and full of holes. Plane was completely destroyed, the pilot and mechanic escaping miraculously.

Preparations for the flight were made by the aerodome chief Captain Valenquela, who late in 1923 made a trip to northern Chile to pick out and arrange for suitable landing places. He was most favorably received and secured the necessary sites.

Also preceding the actual flight, this officer in company with mechanics and soldiers proceeded just in advance of the planes with material for repairs, gas, and oil.

Both before the start from, and after the return to, Santiago, General Contreras, chief of aviation, and the officer pilots were received by President Alessandri.

The aviators received all manner of most enthusiastic receptions at their various stops.

Considering the antiquated material, the slow machines, and some planes with barely sufficient gas capacity for the longer legs, and the further fact that this was the first flight of army planes to the northern part of the country, over admittedly bad forced landing ground, there is very general satisfaction with the flight, although only four of the seven original planes completed the round trip.

It is expected that this flight will give an added impetus to the efforts made to have Congress appropriate funds for rehabilitating the material and planes of the Army Air Force.

GERMANY

THE FLEET FLAGSHIP QUESTION

[Translation of article by Lieut. Werner Grassmann, German Navy]

Of the two flagships for the commander of the fleet as is the present practice in the American Navy, one is quite superfluous and even disadvantageous. "Day in and day out, in time of peace as in time of war, the commander of the fleet belongs on the most powerful of his line ships, and during a battle should be in the very center of the fray." This was, in effect, the opinion of the American officer, Lieutenant Turner, touching the fleet flagship question, as expressed in a recent article wherein he stated his views with temperament and a healthy grasp of the basic principles of naval strategy. He considered the organization existing in all the large navies at the outbreak of the war as the correct one: the admirable tactics of the German lineship squadron in the battle of Skagerrack is due to this organization. We can agree with all the author's contentions if one point is not lost sight of: The author writes as an American naval officer discussing the conditions existing in the American Navy to-day. For this reason, it follows naturally that the question under discussion will probably not be taken up thoroughly, and above all, it will be treated in a manner which takes future developments into consideration. As a matter of fact, there is not much more to be said regarding the important fleet flagship question on the ground of the experiences of the World War.

To start with, a brief comment regarding the person whose development in leadership will be made possible by the fleet flagship: The commander of the fleet shall prepare the fleet (made up of all the most important naval forces of his country) for war; he shall direct their use in war in accordance with the principles laid down by the chief of naval operations, and shall personally command the fleet in the naval battle—that is, in the battle against the similar organization of the enemy.

In a war between world powers he ranks next to the chief of naval operations in importance as the leader of the national forces, entrusted with full responsibility for the well-being of his country, as the results of a naval battle nearly always decide the question of naval supremacy and in any past or future war between great powers, this also decides the final outcome of the war. In this sense

Trafalgar and Tsushima were unequivocally decisive battles, and the battle of Skagerrack would also have been decisive if the commander of the English fleet in full cognizance of this point had not broken off the battle on the morning of June 1. A destructive defeat of the grand fleet would have broken the blockade, immediately assured us naval supremacy in the canal and all other waters accessible to our fleet, and would have wiped England from the list of our opponents, while the political results of such an outcome can not be conceived. Reversed—the destruction of Germany's high seas fleet would have meant not only the immediate cessation of the submarine war but also the loss of the Baltic, and with it unavoidable and rapid overthrow and defeat. Therefore, nothing less than the victory or defeat of his people lies on the shoulders of a commander of the fleet of a great naval power, and it must be assumed that not only all necessary fighting material will be placed at his disposition to assist him in carrying out his heavy and difficult tasks, but also all possible technic of command and administration. The latter is of paramount importance, as any inferiority in material fighting power can be offset by superiority in leading men; this property is felt in every part of the fleet during the entire course of the battle. On the other hand, a fleet superior in material must fail, even with an admirable commander, if the latter's hand slips in handling vital units of the fleet through the effect of any operation or influence during the battle.

It would appear as though, during the development of the fleets to the powerful fighting units which we saw in operation during the war, the development of the technic of leadership for the commander of the fleet must stand far behind that of the material and personal power. Let us take up briefly the means at the disposition of the commander of the fleet, enabling him to watch developments during a battle, make his decisions and communicate his corresponding instructions to all parts of the fleet.

In the German and English navies, one of the newest and most powerful fighting ships was designated as fleet flagship; the names *Kaiser Wilhelm II* and *Deutschland* in peace, and *Friedrich Der Grosse* and *Baden* or *Iron Duke* and *Queen Elizabeth* during war are inseparably united with the history of the two fleets. All these ships were destined as fleet flagships from the very beginning and were constructed accordingly, not losing sight, however, of the main fact that they were to be powerful fighting ships above all things, without any weaknesses in comparison with their sister ships, for all the money appropriated for their construction was destined exclusively for the material fighting features. The result of this method can be considered merely as a makeshift far behind the ideal solution.

The constructive development of a ship to a fleet flagship consists mainly of fitting it as a residence for the commander of the fleet and the major part of his staff. Cabins, work rooms, and office rooms were therefore arranged, besides those ordinarily necessary for the ship. Most always there was also a special admiral's bridge for directing the fleet in maneuvers, etc. Special arrangements for battles were limited to the installation of the most modern (and in comparison with the other ships, most extensive) radio and signal devices and the most careful development of passageways, corridors, etc., within the ship. There was the further regulation that if during a battle, the commander desired to seek armored protection (owing to the important rôle he played, this was necessary) he and the indispensable members of his staff (at least, chief of staff, fleet navigation officer and quartermaster, flag lieutenants for wireless or signals) should go into the commanding station and get along in this frightfully crowded space as best they could. The commander should be impervious to all noise or nervous excitement and make the best of the limited possibilities of supervision at his disposition, keeping a tight grip on the control of the more than 100 vessels comprising his fleet. In this connection, it is interesting to note the suggestions made for remedying this point in the German Navy, i. e., to remove the guns of the forward turret of the fleet flagship and turn the turret into a fleet commanding station. This was never done on account of its weakening the fighting power. Instead, a special crow's nest was built on the tripod mast of the *Baden* as a commanding station, which improved the observation. Considering the paramount importance of the question of leadership of the fleet, it would have been much better to have combined the two. Two guns less in the general fighting line would have had to have been accepted as part of the bargain. In constructing a modern fleet flagship and considering the concessions in arrangement to be made to the element of command, its demands must now always be taken into consideration.

The most favorable position in the fleet must be selected for a fleet flagship equipped in this way. The German and English navies had apparently the same practice in this matter. The fleet flagship held its place in the line-ship squadron which, as could be seen in the battle of Skagerrack, was approximately in the middle in the first third of the battle line. The reason for this comes from the fact that the commander of the fleet, if held fast to the line, had the best view from this position and the best possibilities of communicating signals to his line-ship squadron during any possible developments in the battle.

Let us now see how the organization of the technical leadership, just sketched above, worked out in actual battle: First on the Ger-

man side—Admiral Scheer on the *Friedrich der Grosse* in his backward position with reference to the fleet as a unit, received punctually the reports of the commander of the scouting forces regarding the cruiser battle and the intervention of the English V Battle Squadron (*Warspite* class). He then regulated the course, etc., of the line-ship squadron accordingly and led it about in front of the point of the battle cruiser line approaching from a southern course so that the head ships could now fire on the reversing enemy and the commander of the scouting forces, after reversing, found himself in the correct position at the head of the fighting line.

The next chapter of the battle proved a "chasing fight" as far as the commander of the fleet was concerned; in order to keep the reins and keep hold of the fleeing enemy, he pushed the entire fleet at full speed in long formation at a northwesterly, and later northerly, course. The battle line fell unavoidably more and more toward the head and the leadership devolved on the commander of the scouting forces or the chief of the III Squadron standing in front. As the point of the line was pushed gradually on an easterly course, this was expressly ordered by signal by the commander of the fleet, especially as the commander of the scouting forces could give no reports regarding the siuation in front owing to the failure of the wireless on the *Lutzow*.

In the meantime, without the knowledge of the German commanders, as it was beyond the range of vision of their flagships, a situation developed which had, and was bound to have, a decisive influence on the further course of the battle; while Jellicoe was approaching from the north in broad column formation at a southeasterly course, Hood (III Battle Cruiser Squadron) at a northwesterly course in an east-northeast direction, approached gradually the limit of the range of vision. Rear Admiral Hood fired first (sensible only to the German head). However, as in the poor visibility, he and his ships remained invisible, except for the muzzle fire and now and again, shadow-like outlines, the German commanders at the head, mistaking this enemy which appeared so suddenly as the English main fleet, had a wrong idea of the whole situation. Their counter measures finally led the commander of the fleet, who in his rear position could only explain the sudden clash in front and the sharp deviation of his head as the result of an already effective outflanking, to resume the command again. Without having any idea that the English main fleet had not yet taken any part in the action but, in quite close proximity in the north and in an extremely precarious position, was only just taking battle formation, he withdrew the fleet from the position in which it was threatened to be surrounded. If he had continued in an east-

erly course it would have brought him in the most favorable tactical position possible—just in front of the English head.

The luck of battle, or technically expressed, inadequate facilities for orientation had forced the commander of the fleet to adopt purely defensive measures at the decisive moment just before the beginning of the battle between the two main fighting lines, and thus took the lead from him at the moment when the battle was at its height. The following measures—the second reverse and the attack on the enemy's center—were really defensive measures even though offensive in nature and carried out with the greatest energy in obedience to an order of the commander of the fleet who desired to relieve the untenable situation whose development he could not control. The execution of these defensive measures seems masterful.

During the portion of the battle carried out on the northern course, on the English side, only Beatty, the commander of the cruisers, supervised the whole situation and its possibilities of development without having any idea in advance of Hood's decisive entry into the fray. The flag of the German fleet remained invisible up to the very last moment to the commander of the fleet in the center of his lineship squadron. Jellicoe awaited its appearance to the right ahead but had to postpone the order for development as he was unable to form any picture as to on which wing the deployment would finally occur. In his book the "Grand Fleet," the description of these extremely diquieting uncertainties directly before the clash fills several pages. Diagrams 1 and 2 of the supplement show the two possibilities of development and the explanatory text pictures the great worries of the commander of the fleet before the decisive signal which finally occurred at the last moment, already within the firing range of the German head. Contrary to his expectations, the German line came in sight much earlier and more to the west, somewhat south of his western wing, the head already turned on an easterly course so that the grand fleet in column bearing northeast-southwest on a southeast course, finally came in the most unfavorable position possible for its deployment to the line. Jellicoe chose the least of two evils and developed on the eastern wing column; in doing this he had to accept the fact that this removed him from the enemy and thus enabled the latter to attain the most favorable front position on the easterly course. There was a dangerous compression at the turning point of the eastern wing. In their advance maneuver, Beatty's battle cruisers masked the fire of the squadron for some time—in the meantime the luck of battle stepped in and made Hood seem as the saviour—albeit without intention on his part, merely as the result of a mistake in reckoning.

Therefore, neither of the fleet commanders were in a position to get a correct idea of the situation up to the moment of the clash—the

decisive "battle for the initial position," practiced so often in peace maneuvers, did not occur and this although the cruisers of both sides responsible for the scouting had been fighting for hours, in fact, the English, including a lineship squadron, had been fighting the German main fleet. Neither had had the opportunity to influence the situation decisively at the crucial moment through the exercise of their leadership, and both had to restrict themselves to making the best of a critical situation whose development had passed out of their hands. *The technical means of leadership had failed on both sides.*

Three things were to blame for this: First, the commanders who were in front were unable even with the best will in the world to communicate a more or less correct picture of the strength and position of the enemy to their commander in chief. The technical communication devices had not proved adequate to the demands of a naval battle. Also the piling up of reports from various points shortly before the decision was more confusing than otherwise. Secondly, the main proviso for absolutely satisfactory reports would have been that the dead reckonings of all points, the reports given or received, from beginning to end should have been absolutely correct or according with one another. On the English side there was a difference in reckoning of 12 statute miles between the commander of the fleet and the commander of the cruiser forces which resulted finally, it is true, in the saving appearance of Hood, but likewise in the highly unfavorable position of the main English fleet shortly before the deployment. Anyone who experienced the difficulties of exact navigation during the cruiser battle, in which the vessels were moving at full speed on a continually changing course, added also to the question of the current in the North Sea, will be able to understand the discrepancies in reckoning. Thirdly, the commanders of the fleet had no opportunity on their flagships to get any correct conception of the situation. It may also be stated here that in the late afternoon of March 31, 1916, the visibility was especially poor (smoke, powder, and approaching twilight). In the naval battles of the future, as is pointed out later, one will scarcely be able to count on any better visibility.

To endeavor to better the past is useless. The thing to do is to try to extract some lessons from it for the future. What differences will the immediate future bring in the composition of our fleets and methods of combat as compared with the battle of Skagerrack? Besides the line-ship squadron, cruisers of all types and torpedo-boat flotillas, there will be rapid aircraft carriers with efficient torpedo planes on board and large submarines keeping step with the fighting lines and carrying both torpedoes and mines. The firing radius will be further increased as a result of the technical improvements of

artillery material and the presence of artillery planes on all battleships; the introduction of trackless torpedoes, the possibility of which is being repeatedly discussed in technical publications, will probably increase the firing range still more, up to the "safety limit." At the same time, there will be no individual dodging of torpedoes, as in the Skagerrack battle, as every torpedo-boat attack must be answered by an extensive evasive maneuver of the entire line.

The tactical use of smoke and fog screens in the battle of Skagerrack was still in its infancy; the next naval battle will show their finished and highly extensive use according to carefully thought-out methods. This question presents unthoughtof possibilities—protective possibilities as well as a means of deceiving the enemy. Yes, it almost seems as though in future an inferior fleet can calmly go into battle with the consciousness that, should things begin to take an unfavorable turn, it can draw away by using smoke and fog screens, which it would be a mad risk for even the superior forces to attempt to penetrate. The possibility of supervision for the commander in chief will grow less and less, and the unfavorable conditions existing during the battle of Skagerrack will remain no exception. The basic difference between a battle on land and one at sea (in the former, unlimited camouflage possibilities; in the latter, clear field of vision) exists no longer and naval operations in the future must give this fact main consideration.

What will now be necessary to the future commander in chief in the way of technical aids? He must be perfectly clear regarding three points from the very first, in spite of the great advance and improvements in the province of communication, in the future it will be impossible to guarantee a system of communication operating surely and accurately and sufficiently rapid under all circumstances; conflicting reports from assistant commanders will be unavoidable; errors and differences in reckoning can not be avoided, even through the most careful work. One point remains—to see things himself either with his own eyes or through those of his personal staff, intrusted with all his doubts and ideas. And another point—if the above-mentioned demands can not be carried out under all conditions, then he should at least have verbal communication with those intrusted with the task of clearing up any doubt, and be able to receive a verbal report after the settlement of the task in question. The most difficult as well as the most important thing is to gain a quick survey of the existing situation; the proper commands can then be communicated to the units and divisions of the fleet with the present existing apparatus; this also operated at the battle of Skagerrack.

Taking these various points of view into consideration, the following are the points required of the fleet staff headquarters (that is, the flagship together with the special types of vessels necessary to carry out the duties of command):

1. Maximum speed. The excess of speed over the "line" must be so great that any change of position necessary for orientation can be carried out with all possible speed.

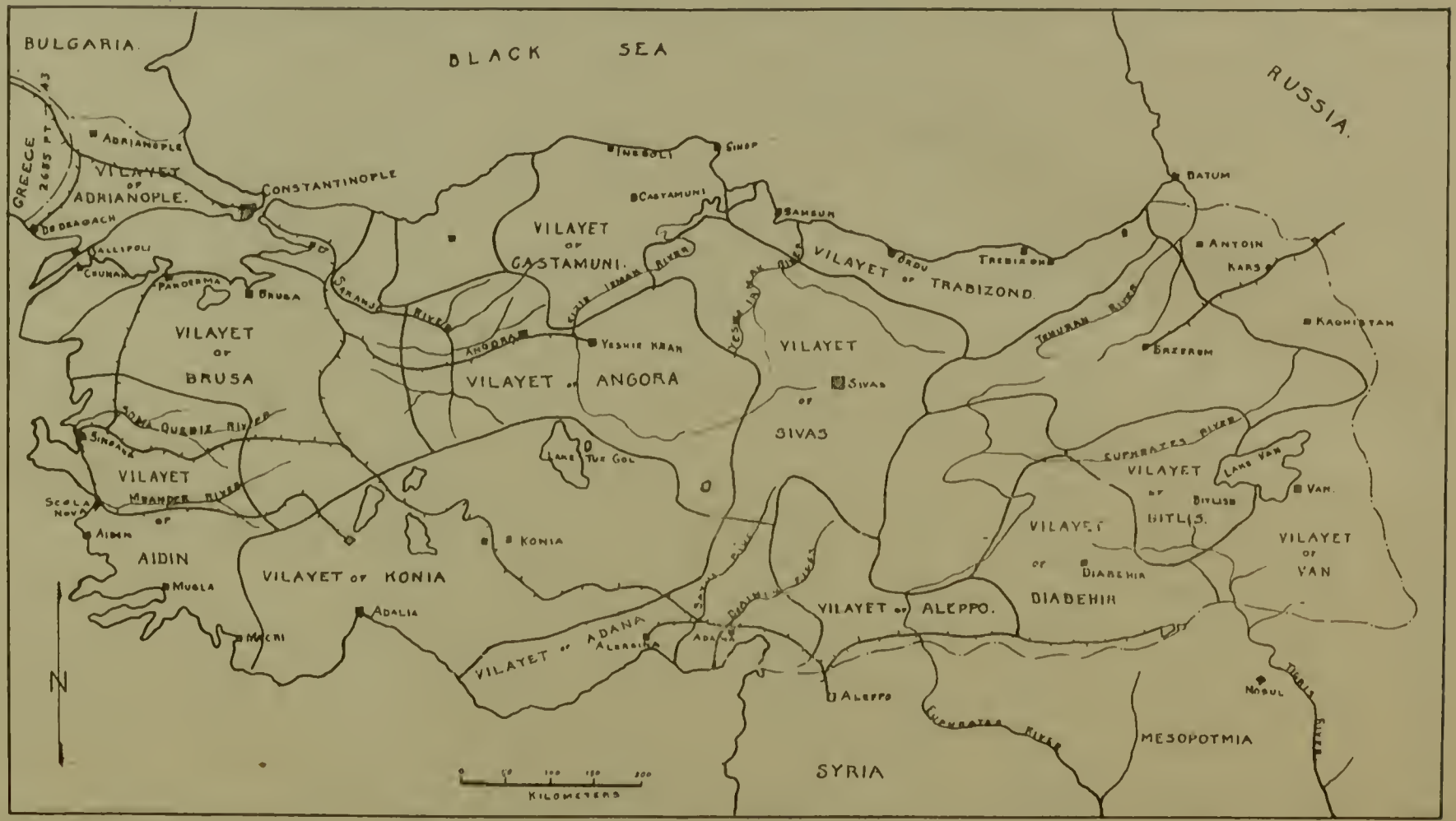
2. High line of sight which will make it possible for one's own or the enemy's smoke or fog clouds to afford protection against the sighting and direction apparatus of the artillery, but not against that of the fleet command.

3. Detail of a group of rapid ships of the types of modern flotilla command ships, which at the failure of direct visual observation can be sent on verbal orders through the smoke screen up to the new limit of vision or establish safe and sure communication with the undercommanders.

4. Complete supply of all modern communicating apparatus, including numerous reserves for the power generator and wireless telegraphy.

5. Finally, an armament which can shake off all opponents with the exception of the large battleships. For this purpose there should be an extensive armored and subsurface protection as well as extensive screen (fog) apparatus.

It must be left to technique to decide whether all these demands can actually be consolidated into a manageable ship. But probably the following proposal will indicate, at least approximately, the direction the future "ideal" fleet flagship will take: a vessel of the type of an airplane carrier, similar to, but perhaps smaller than the English *Furious* or the new constructions of the American and Japanese navies. Speed, 35 to 40 knots; radius commensurate with that of the other cruisers of the fleet; front body normal; a flat airplane deck behind the funnels extending over the long aftership. Catapults to start airplanes; landing on airplane deck. All airplanes of this carrier are for the exclusive use of the fleet commander. These airplanes are not for general reconnaissance work but only for quite distinct and limited tasks before and during the battle and the observers are to be staff officers. Armament, 4 to 6 heavy guns (25 to 30.5 cm.) in two extra high double or triple turrets in front of the bridge; 8 to 12 antiaircraft guns (12 cm.) in deck erections on aftership. A few deck torpedo tubes as well as a group of mine throwers on each side of amidships for fighting submarines. Protective measures: arrangement of armor and subsurface protection similar to that of former German battle cruisers and improved protection against direct or indirect bomb hits (detonating close to the outer wall). The armor plate can be much



Sketch map of Anatolia

less thick in many places. It would naturally be desirable not only to have the one vessel as fleet flagship but also several vessels of the same or similar type in the fleet in order to confuse the enemy and make it difficult for them to recognize the flagship proper.

Many roads lead to Rome. The purpose of this article was to explain basic principles. Weapons and men, welded into a fleet, will then be able to destroy the enemy and attain the decisive victory for their Fatherland when the chosen leader—the commander of the fleet—at any moment before and during the decisive struggle can pour forth over the fleet his art of leadership based on accurate observation and a determination to win.

TURKEY

ESTIMATE OF THE ECONOMIC-MILITARY SITUATION

April, 1924

[Prepared by the War Department, Military Intelligence Division]

AGRICULTURE

The agricultural resources of Turkey are abundant and varied. The differences of soil and climate are productive of every variety of produce grown from southern Russia to Egypt. The rainy and well-watered littoral of the Black Sea produces great yields of tobacco, flax, hemp, opium, nuts, fruits, vegetables, and cereals. The littoral of the Ægean and the Mediterranean, hot and dry in summer, produces an abundance of cotton, grapes, figs, oranges, lemons, olives, and seeds (sesame, linseed, canary), while the inland regions produce chiefly cereals, opium, and gum tragacanth. We find in certain valleys of Eastern Turkey rice production and the cultivation of the silkworm. The central part of Turkey, slightly rainy, possesses vast areas of arable land whose development is contingent upon irrigation. The increased production of the land, included in the German irrigation project on the plains of Konia, concluded in 1915, where the yield was increased from 3 to 15 fold, indicates the results to be expected. It must not be presumed that the whole of central Turkey needs only irrigation. A part of central and southern Anatolia is formed of calcareous land which through deforestation and subsequent erosion has become waste land. A great part of the soil needs fertilization. The rich lands formed from mud and moraines and specially suitable to the growth of cereals are somewhat scarce.

Cereals are the most important products, wheat being foremost, although barley, corn, rye, oats, and millet are grown. Experiments

indicate that the beet-sugar industry will succeed. Sericulture is capable of great development. The conditions of land tenure constitute a hindrance to the development of agriculture. A very considerable part of the land is held by the state and by the church. The tenant system whereby the landlord acquires half the produce is discouraging. The tithes and taxes although reduced somewhat are onerous and need reform.

In spite of the setback due to the ravages of war certain measures were taken as a result of war which should be ultimately beneficial. Agricultural machinery was ordered in large quantities from Germany and the agricultural bank was reorganized and developed for extension of rural credits. Students were sent to agricultural schools in Germany and Hungary. The Government assumed control of crops and even formed labor battalions. All this helped to replace the primitive agricultural methods. The present Government is promoting in every way the industry of agriculture by removing duties on all imports of agricultural machinery, by distribution of seeds, by voting credits to the agricultural bank, by teaching soldiers the use of farm machinery, and by seeking to reduce the taxes. The area under cultivation in 1922 was estimated at about 11 per cent, but commerce reports state that three times this amount was under cultivation in 1923. It is known that production was much increased. The tobacco crop was very large and the cotton crop is estimated at 70,000 bales. The essential need of greater importance than all other needs combined is that of an adequate system of transportation. So long as the producer can not market the surplus crops there is no incentive for excess production. At present only those regions tapped by railways or adjacent to ports are able to approach a proper development of industry.

STOCK RAISING

The requisitions and ravages of war reduced the numbers of horses and horned cattle to about one-half, while the numbers of sheep, goats, and camels were still further reduced. The Government is encouraging the importation of cattle by exemption of import duties and, in spite of the considerable effects of the hoof and mouth disease, the industry is slowly reviving. Angora, Sivas, and Konia in order are the most productive wool centers. Before the war Anatolia exported annually to Europe and America approximately 35,000 bales of wool. The present exports are less than 50 per cent of the pre-war figures.

MINING

No accurate and comprehensive survey has been made with respect to the mineral resources of Turkey, although the Germans

made extensive explorations in certain regions during the war and came to the conclusion that the value of the widely heralded deposits was greatly overestimated. It is known however that a great variety of mineral wealth exists and, with the construction of railways which will tap these regions, mining should become, next to agriculture, the mainstay of the country.

Emery.—The mines of Smyrna, Konia, and Adana have been extensively mined since ancient times.

Copper.—Rich copper deposits exist in the Black Sea watershed and in the Taurus Mountains extending from the vicinity of Van and Bitlis to Alexandretta. The famous Argana mines near Diarbekr, estimated to contain 2½ millions tons of ore, are being exploited, but there are many other deposits fully as rich not yet touched.

Silver-lead ore is found in the Black Sea and in various other districts. The Cumush Hadji Key mines are extremely rich and were worked in ancient times. Rich deposits exist near Argana and Kharput.

Iron ore is found practically all over Anatolia, usually with silver-lead and copper. Deposits exist at Papas, near Adana, on the Black Sea coast near Trebizond, and at Boli, which is near the coal deposits of Eregli.

Zinc is invariably found with copper and lead. It is exported from the Balia Karaaidin mines.

Manganese is found extensively on the Black Sea coast, also in Adalia. Rich deposits exist at Eregli, also at Gneredeh and Deorek.

Mercury is found at Alashehir, Sivri Hissar, and Konia.

Magnesite, a rare stone, is found at Eskishehr.

Boracite.—Anatolia furnishes the supply for Europe and Asia. Found near Panderma. Annual production 6,000 tons.

Gold has been found in various places and assays from 1 to 30 grains to the ton.

Sulphur.—Deposits exist in Konia. It was exported to Germany during the war.

Antimony mines exist at Odemish, Brussa, and Janlikaya.

Chromium.—There are many mines in operation, chiefly in the provinces of Aidin and near Mersina. The quality of ore is excellent.

Salt is found in abundance, particularly near Erzerum, Bitlis, Kharput, and Sivas.

Coal.—The richest known coal deposit in Anatolia is on the Black Sea coast between Eregli and Ineboli. This coal is bituminous and is excellent for producing coke. The present output is 1,800 tons a day. This may be vastly increased. Important coal deposits exist at Olti in Armenia.

Lignite exists in widely scattered regions, but it is found extensively throughout Anatolia. Important deposits are in the Smyrna district.

Marble.—The quarries of Marmara Islands, of Kara-Hissar, and of Ismidt, all located near the Sea of Marmora, contain every variety of marble. They are well situated for exploitation and with the introduction of machinery for extracting, cutting, and polishing, large quantities should be produced for export.

The annual pre-war production of ores in Turkey is indicated in the following table:

Kind of ore		Production in metric tons
Antimony		1,500
Asphalt		7,000
Bituminous coal		730,000
Boracite		16,000
Chrome ore		15,000
Copper		1,500
Emery ore		15,000
Iron pyrites		20,000
Lead		10,000
Lignite		30,000
Manganese ore		12,000
Meerschaum		250
Zinc ore		2,000
Mercury	flasks	4,500
Silver	kegs	250
Gold	do	45

Petroleum.—Deposits of petroleum are found in the Smyrna and Adana districts. Rich deposits are reported south of Bitlis and Diarbekr. Close surveys of these fields have not been made. The richness of the Mosul region, claimed by Turkey, is well known.

In general, the mineral reserves of Turkey are much larger than is generally known. The resources of Turkish Armenia and Kurdestan have not yet been fully explored. In Anatolia there remain also extensive areas that have not been touched. In western Anatolia ore and coal lie in such close proximity that smelting could take place almost at the pithead, which would, of course, add much to the economic value of the products.

The present mining laws of Turkey are such as to hamper proper exploitation. Mining methods and equipment are in general primitive. Transportation is entirely inadequate.

Fisheries.—The annual value is estimated as being in excess of $10,000,000. Sponge fisheries constitute a considerable item.

Manufactures.—Apart from agriculture and mining, Turkey possesses no industries of importance and for this reason the Government recently enacted a tariff law whose purport is to create and

foster manufactures. It is considered unsound economics to send skins all the way to America to be returned to Turkey in the form of footwear. Existing factories are in the main such as have been necessitated by military exigencies and produce cloth for army uniforms and blankets. However, private enterprises have been initiated which suggest future expansion. By this is not meant the native carpet weaving or silk spinning or flour milling industries as much as more modern attempts to manufacture cotton cloth and cotton oil, yarn, paper, and cement, machinery, soap, shooks and tannin, towels and kimonos, glazed tile and pottery, leather, and ice. While manufacturing in Turkey certainly will grow, there is no likelihood of early or radical changes. Against such militate the immemorial traditions of the inhabitants and more particularly the transport, motive power, and labor situation. A few cotton mills exist in Constantinople, Smyrna, Magnesia, and Adana. The total industry comprises about 50,000 spindles.

Labor.—Apart from the porters and boatmen in the seaports, there is no professional labor class in Turkey. Skilled artisans mostly work for their own account. In silk spinneries and cotton mills, women and children are employed. Generally labor is casual. There are a few labor associations in Constantinople but they are not aggressive and Bolshevism has been received by them with a marked lack of interest.

Power.—There is little use made of electricity outside of Constantinople, except in rare instances for lighting and traction. Steam and petroleum driven engines are not uncommon but hand-power is the rule. Water power is plentiful but almost entirely unused.

Forests.—Forests prevail over the entire Black Sea slope of Asia Minor and there are also extensive timber lands in the regions of Sivas, Brusa, and Adalia, and in the Taurus and Amanus Mountains. On the other hand, the Armenian forests have disappeared. There is no system of reforestation. Wood as fuel is unknown in certain localities. Turkey imports large quantities of lumber from the Danubean countries and the principal forest areas are owned by the Government and total 8,000,000 hectares or 19,760,000 acres.

Commerce.—As agriculture is the chief industry, and commerce must necessarily be based upon the distribution, exchange, and sale of the fruits of this chief industry, the revival of commerce is largely dependent upon the revival of agriculture, the needs of which have been discussed. Lack of port facilities, railways, and ships also hampers commerce. Commerce fell to a very low ebb during the Greek-Turco War. The three greatest ports of Turkey, Smyrna, Constantinople, and Mersina, were not available, and Samsoun, Adalia, and Ineboli, next in importance, were not fed by railways

from the interior and lacked extensive port facilities. Development of ports, railways, and industries vital to the upbuilding of commerce depends chiefly on the influx of foreign capital, as Turkey has not the means to finance these undertakings.

The tariff laws have been readjusted with the view of attempting to restore the balance of trade. Heavy duties have been placed on import of luxuries and on such products as flour and leather—as Turkey has the raw material which may, by the creation of milling and leather industries, be transformed into the finished product.

During the first six months of 1923 total imports amounted to a value of 62,531,778 Turkish pounds and exports to 31,841,382 Turkish pounds.

The countries of greatest importance from the point of view of Turkish imports were:

	Turkish pounds
Great Britain	9,839,538
Italy	9,411,590
United States	7,343,973
France	5,592,718
Egypt	3,412,008
Germany	2,999,023

The countries of greatest importance from the point of view of Turkish exports were as follows:

	Turkish pounds
Italy	5,958,233
Great Britain	4,355,623
Germany	3,822,235
United States	2,984,505
France	2,686,335

The principal imports are cotton goods and textiles; exports—tobacco and fruit.

Chief exports to United States are tobacco, carpets, sausage casings, pelts, nuts, mohair, wool. Chief imports from United States are cotton and woolen goods, oils, sugar, leather goods, flour, automobiles, and tractors; but flour and leather imports are decreasing on account of import duties.

The treaty recently negotiated between Turkey and the United States, but not yet ratified by the Senate, provides for freedom of commerce and navigation between the two countries upon most favored nation treatment. The merchant ships of the two countries are not to be subjected to higher tonnage dues on port charges than national vessels. Most favored nation treatment as regards import duties is accorded to articles exported from one country to the other and no export duty is to be levied higher than that imposed upon similar articles exported to any other foreign country. No pro-

hibition or restriction shall be imposed upon the importation or exportation of an article which is not equally applied to those of the most favored nation. Vessels and goods of the two countries shall be accorded the same facilities accorded to those of a third country, irrespective of any favors granted by the third state in return for special treatment. This does not apply to the commerce between the United States and Cuba and the Panama Canal Zone, nor to special arrangements between Turkey and the countries detached from the Ottoman Empire since 1914.

Ports and shipping.—Turkey has few good ports considering the extensive coast line. Smyrna, Constantinople, and Mersina are the most important, but even these lack proper terminal facilities. Smyrna is naturally the greatest port and commercial center but the fire of September, 1922, destroyed so much of the city as to set back for a long time its full utility.

Constantinople does not offer the same facilities of railway connection with the hinterland as does Smyrna, and possesses no great manufacturing industries to vitalize the port. It is favorably located for a distributing center.

Mersina is third in importance and is fed by means of the Adana Railway, which taps the Cilician Plain. Vessels must anchor in an open roadstead. Port facilities are poor, but a French company has the concession for the development of this port and has already spent about one million francs. The plans call for a modern harbor inclosed by extensive breakwaters.

Samsoun on the Black Sea is of some importance, and in case the Samsoun-Sivas Railway is completed it will take on added importance. It taps a hinterland of considerable extent. Tobacco is shipped chiefly through this point. It possesses an open roadstead, and vessels must anchor some distance off shore.

Trebezond, also on the Black Sea, is the terminus of the old caravan route from Persia and has some pretensions to a harbor in the shape of a small breakwater, behind which vessels drawing 15 feet may anchor and discharge.

Minor ports are on the Black Sea: Ineboli, Sinope, Eregli, Zunguldak. On the Sea of Marmora: Haidar Pasha, Ismid, Geumlek, Mudania, Panderma, and Chanak. On the Mediterranean: Aivali, Dikeli, Marmarice, Makri, Adalia.

Shipping.—It is estimated that Turkey had not more than 110,000 tons of shipping at the beginning of the Great War. This was because the capitulations gave foreign vessels the rights of competition in coastwise trade which could not be reserved to ships of Turkish registry. The Turkish chamber of commerce estimates the strength of the Turkish merchant marine, as of November 1, 1923, as of 82,948 tons. Six of these vessels exceed 3,000 tons, all under the Seir Se-

faine (Turkish Shipping Board) which controls 35 vessels aggregating a tonnage of 37,494. Most of the Turkish shipping is limited in equipment. Turkey has now limited its coastal shipping exclusively to vessels under Turkish registry, and a new impetus has been given to the development of a national merchant marine. The Seir Sefaine has started a service between Black Sea, Aegean, and Mediterranean ports and is trying to augment its tonnage through the purchase of more ships and improved methods of operating.

FINANCE

Public debt.—By the decree of Mouharrem issued by the Sultan in 1881 certain foreign loans were consolidated into the unified debt which, together with the Turkish lottery bond issue, was placed under the control of the council for the administration of the Ottoman public debt, consisting of the representatives of the chief European countries in which the bonds were held. The service of this debt was assured by the concession in full ownership of monopolies on salt and tobacco and revenues from spirits, fisheries, and other fixed sources. The decree of 1903, known as the decree "Annex of Unification and Conversion," simplified and reconstituted this debt in accordance with the demands of the council.

Although these decrees concerned only the Ottoman debt as it stood in 1881, the administration of the debt council was so successful that in nearly all loans subsequently made up to 1914, stipulations were inserted providing for the allocation of certain revenues for the service of the loans to be collected and administered by the council of public debt, so that eventually a great part of the total revenue of the kingdom was controlled by the council. Since October, 1922, receipts have been falling steadily owing to the action of the Angora Government, which has held back all the receipts from the ceded revenues except certain local receipts in Constantinople and the immediately surrounding districts.

The public debt of Turkey prior to the war in 1914 was:

(1) Unified debt	£T 47,466,815
(2) Other loans floated in France	59,282,102
(3) Other loans floated in Germany	23,862,520
(4) Miscellaneous loans (municipal and short term)	12,630,320
	£T143,241,757

The debt contracted during the war consists of:

Emission of paper money	£T159,859,936
Internal loan	17,977,600
Military advances and equipment	55,000,000
	£T232,837,536

It is estimated that the subsequent obligations contracted through requisitions and to cover arrears amount to more than £T33,000,000.

Summary

External public debt before war	£T143, 241, 757
Contracted during World War	232, 837, 536
Subsequent obligations (estimated)	33, 000, 000
	£T409, 079, 293

To obtain an accurate idea of the weight of the Ottoman public debt it must be considered that in every likelihood the issues of paper money may become a permanent element of Ottoman currency; that is, will never be redeemed. The same applies to the guaranteed loan, the defense loan, and the Egyptian tribute loan, as the service of the loan is a charge against Egypt. This involves a deduction of £T159,859,936 as carrying no interest charges, leaving £T249,219,457 or at a par value of $4.46 per Turkish pound, $1,111,518,332.

The pre-war public debt of Turkey will be reduced by probably 40 per cent leaving approximately 90 million Turkish pounds instead of 143 millions.

Under the provisions of the financial clauses of the peace treaty, articles 46 to 57 fix the rules under which the Turkish foreign debt will be divided between the states in favor of whom territory has been detached from the Ottoman Empire, either after the Balkan wars or as a result of the war, 1914–1918. The principle regulating the division is as follows:

The share of each state will be determined in accordance with the proportion which its revenues bore to the total average revenue of the Turkish Empire during the financial years 1910–11 and 1911–12. The council of the debt will allocate the various shares, and each interested state will have the opportunity of being represented on the council.

The loans prior to October 17, 1912, and the annuities of such loans shall be distributed between the Ottoman Empire as it existed after the Balkan wars of 1912–1913, the Balkan States in favor of which territory was detached from the Ottoman Empire after those wars, and Italy and Greece, to whom the Aegean Sea islands have been attributed. The residue of the loans for which the Ottoman Empire remained liable after this first distribution, together with the loans contracted between October 17, 1912, and November 1, 1914, and the annuities of such loans shall be distributed between Turkey, the newly created States in Asia in favor of which a territory has been detached from the Ottoman Empire under the present treaty, and Greece.

A commission shall meet in Paris to determine the method of carrying out the distribution of the nominal capital of the debt.

The annuities due by the states in favor of which a territory has been detached from the Ottoman Empire after the Balkan wars shall be payable as from the coming into force of the treaties by which the respective territories were transferred to those states. The annuities due by the states newly created in Asia and by Greece shall be payable as from March 1, 1920.

The payment shall be made to the Ottoman debt council, without interest, by means of twenty equal yearly installments from the coming into force of the present treaty.

Article 52 regulates on the same basis the distribution of the advances made to the Ottoman Government before the war, and which had not been consolidated by loans.

Miscellaneous clauses stipulate, for instance, the reciprocal renouncement by Turkey and the Allies of all pecuniary claims for reparations, and the renouncement by Turkey of all claims for reparations against the Greek Government, including claims recognized by Greece.

FOREIGN INTERESTS AND CONCESSIONS

The financial and economic interests of France in Turkey exceed greatly those of any other country.

The total French interest in Turkey in 1913 was 50.5 per cent against 14.3 per cent British.

Before the war it is estimated that 1,000,000,000 gold francs were invested by French capital in private enterprises in Turkey.

The French interest in the pre-war Turkish national debt is over 60 per cent.

Under the treaty of Angora ratified November 6, 1921, France receives economic concessions. These are set forth fully in a document accompanying the treaty. The Turkish National Government undertakes to afford every facility to French industrial and financial concerns.

The Turkish National Government accepts as a basis of reciprocity the renewal and extension of all privileges and concessions granted French companies and institutions in Turkey generally.

The protocol of the Lausanne treaty relating to certain concessions granted in the Ottoman Empire provides that all concessionary contracts and subsequent agreements duly entered into before October 29, 1914, are maintained in principle, with the exceptions of Vickers, Armstrong & Co., and the Regie Generale de Chemins de Fer. It is understood that, should the concession not be renewed, after modifications, the Turkish Government undertakes to pay to the said companies such indemnity for the loss actually suffered for the cancellation of their old concessions as the experts determine to be equitable.

The protocol also stipulates that a settlement of accounts will be proceeded with by the state and to beneficiaries under contracts and agreements, in respect of the use by the state, of their property or services. The provisions of the contracts and subsequent agreements shall, by agreement and as regards both parties, be put into conformity with the new economic conditions.

In the absence of agreement within one year from the coming into force of the treaty of peace, both with regard to the settlement of accounts and the readaptation of concessions, the parties will accept the decision of two experts nominated by the head of the Swiss Federal Department of Public Works.

Concessionary contracts which have not begun to be put into operation are maintained, but beneficiaries under such contracts can not avail themselves of the provisions of this protocol, relating to readaptation. These contracts may be dissolved at the request of the concessionnaire and an indemnity may be granted.

Agreements entered into between October 30, 1918, and November 1, 1922, shall remain in force until they have received the approval of the Turkish Government. If this approval should not be granted, a compensation fixed by experts shall be paid to the concessionnaires.

The provisions of this protocol do not apply to agreements entered into since April 25, 1920, between the Government of the Grand National Assembly of Turkey and concessionnaires.

Concessions granted by the Ottoman Government in territories detached from Turkey shall be maintained by the states which acquire the territory. The provisions of this protocol shall be applied to the concessions by these states.

Facilities are granted to companies holding concessions in territory detached from Turkey to take a nationality other than Turkish, or to divide their undertakings into distinct companies.

CURRENCY

Before the war, Turkey was on a gold currency basis, the standard value being the Turkish pound (£T) value about $4.46. The pound is divided into 100 piasters, the piaster into 40 paras. There were convenient gold, silver, and copper coins, almost the entire circulation being in metallic money. The Imperial Ottoman Bank had the privilege of issuing notes against a one-third gold reserve. Few of these notes were in circulation. The present paper money issued during the war, was guaranteed by the Ottoman public debt. The first issue was secured by gold deposits made in the banks of Berlin and Vienna, which sums were transferred to the Allies after the war. By the treaty of Lausanne Turkey renounces its rights to these gold deposits and the council of the administration of the

Ottoman public debt is freed from all liability to make payments relating to the first issue.

Turkey has issued no paper money since the armistice and although the issue extant is somewhat excessive, other European countries are much worse off in this respect. With a revival of Turkish economic life the paper currency should increase in value.

BANKING

The banking system is controlled by foreigners, the French interests predominating.

The Imperial Ottoman Bank, founded in 1863 by French and British capital, controls about one-third of the commercial banking business of the empire and is the dominating financial influence.

Other important banks are the American Express Company, Agricultural Bank of Turkey, Crédit Lyonnais (French), Russian Bank (Russian), Banca de Roma (Italian), Bank of Athens (Greek, French), Bank of Salonica (French), Banco Commerciale Italiana (Italian), Italian Bank, Ltd., The Banque Hollandaise pour la Méditerranée.

These banks were largely instrumental in furthering the financial projects and interests of their own nationals; in other words, of exploiting the country. Because of the preference given by the banks to foreigners the natives have been denied the experience in financial matters which might have enabled them to assume control of their own economic life.

The banks, with the exception of the Agricultural Bank of Turkey, have never supported agriculture, nor have they been inclined to furnish funds to promote legitimate industries and enterprises, except for their own nationals or for themselves, thereby securing all the profits.

BUDGET

Prior to the Great War the expenditure generally exceeded the receipts by a few million pounds.

In March, 1913–February, 1914, out of a total revenue of over £29,000,000, more than £13,000,000 was received from direct taxes, of which more than £7,000,000 was derived from tithes. The budget for the same period provided for an expenditure of more than £47,000,000, the greatest single item being £17,872,659 for the army and £9,557,321 for the public debt loans.

The budget for 1921–22, the first prepared by the Angora Government, provided for an expenditure of more than £86,000,000, £45,000,000 of which were for national defense and £8,000,000 for public debt loans.

The greatest receipts were derived from tithes which produced more than £17,000,000; Tombac (an alloy of zinc and brass), more

than £15,000,000; salt, more than £6,000,000; income tax, £6,000,000; cattle taxes, £7,000,000; exemption from military service, £5,000,000. The deficit was about £8,000,000.

The budget for 1923–24 experienced a deficit of several millions of pounds, while the tentative budget for 1924–25 provides for expenditures of about £7,000,000 in excess of receipts. The ministry of finance, however, claims to be able to wipe this out by means of certain revenues not yet included in the budget. The abolition of the Caliphate and the subsequent appropriations by the Government of the revenues of all the Evkaf, or church lands, known as the pious foundations, will decrease the deficit.

RAILWAYS

The railways of Turkey are single track, as a rule, of standard European gauge, 4 feet 8½ inches, and were built by foreign capital. They are for the most part well constructed, particularly those lines included in the German Berlin-Bagdad system.

Oriental Railway.—In Turkey in Europe, the only railroad in existence runs from Constantinople to Kuleli Burgas on the Maritza River, a stretch of 174 miles. The line continues through mixed territory, passing Adrianople at a distance of three-fourths mile until it reaches the Bulgarian frontier at Svilengrad, whence it proceeds to Sofia and thence to Paris. Constantinople is reached from Paris in 3½ days. At Kuleli Burgas a branch of the main line deviates toward Dedeagatch and Saloniki. A short branch line (31 miles) to Kirk Kilisse was completed in 1912.

Anatolian Railway.—The so-called Anatolian Railway runs from Haidar Pasha (Scutari) to Eskishehr, where it forks, one branch connecting Eskishehr with Angora (distance from Haidar Pasha 360 miles), another connecting Eskishehr with Konia (276 miles). A side line starting from Hamidieh has been built to Ada Bazar and will be continued to Bolou. In 1912 the Anatolian Railway required no Government aid and actually paid into the Turkish treasury some $200,000 as excess profits (25 per cent of the total). This is a German-owned concession and an annual gross kilometric revenue is guaranteed by the Turkish Government.

Under article 260 of the Versailles treaty the ownership of all German undertakings in Turkey was to be transferred to the Allies, including of course the Anatolian Railway and the rights of exploitation of the Bagdad Railway held by the Anatolian Railway. It seems, however, that the Deutsche bank group was not in technical control, but that the Banque des Chemins de fer Orientaux of Zurich, Switzerland, a neutral concern, controlled the concession. Although probably representing the Deutsche group, it made a

complicated situation. It seems now that the Allies will not receive the concessions, but that they will either be turned back to the Swiss bank or that the Turkish Government will exercise its right under a clause of the concessionary contract to purchase the lines. The matter is now under consideration.

Bagdad Railway.—At Konia begins the Bagdad Railway which also is controlled by the Deutsche Bank group, and like the Anatolian Railway enjoys a kilometric guarantee. This railway is completed as far as Nisibin in upper Mesopotamia, thus crossing the fertile Cilician plain and covering a stretch of 650 miles. The British have not permitted a continuation of this road to Bagdad.

Pending the settlement of Anatolian-Bagdad Railway concessions the line from Konia to Aleppo is operated by the Turks and from Aleppo to Nisibin by the French. French interests (the Imperial Bank) hold 40 per cent of the stock in the Bagdad Railway. From Marume the last station of the Anatolian Railway in the Cilician plains the road starts an ascent passing over eight bridges and seven smaller tunnels of a total length of 1,937 meters before reaching Bagtsche, situated 536 meters above the sea level. Between Bagtsche and the main tunnel the railway leads through two more passages of 73 and 117 meters. The main tunnel has a length of 4,853 meters. Four other tunnels, with a length of 1,067 meters, follow before the road reaches Islahie.

The great bridge across the Euphrates at Djerablis was destroyed during the war and is not yet rebuilt.

Smyrna-Aidin Railway.—This railroad is the oldest in Turkey and has consistently been under British control and management since 1856. Starting from Smyrna it runs south and eastward as far as Lake Egirdie (293 miles). Since 1888 the Smyrna-Aidin Railway has had no kilometric or other financial guarantee from the Government. Its chief strength lies in the natural resources of the tributary territory and its conservatism which does not allow for adventures.

Smyrna-Kassaba Railway.—Originally a British concession, this railroad in 1893 came into the possession of a French-Belgian concern which since has extended the line to Afium Karahissar and, furthermore, built a railroad (212 miles) from Magnesia to Panderma vie Soma (total mileage 431 miles). It is protected by a Government guarantee but only certain sections have taken advantage of it and it is anticipated that in a short while the entire line will be self-sustaining.

Mudania-Brusa Railway.—Running from Mudania on the Sea of Marmorà to Brusa this railroad covers but 25 miles. It is a narrow-gauge line and is relatively unimportant but has possibilities depending upon the development of Brusa as a health resort. No Govern-

ment guarantee is involved. It is operated by a French-Belgian concern.

Mersina-Adana Railway.—Although only 42 miles long, the Mersina-Adana Railway plays an important part as an outlet to the sea for the Cilician section of the Bagdad Railway. It is owned by the Deutsche Bank and enjoys no Government guarantee.

In the northeast, Erzerum-Sarakamish, narrow gauge.

Sarakamish-Kars-Tiflis, gauge 5 feet, connecting with the Trans-Caucasus Railway.

Proposed railways.—The immense and fanciful Chester project has failed and the concession is revoked. Turkey is constructing a broad-gauge railway from Angora-Sivas. One hundred and sixteen kilometers of this road from Angora to Bali-Chukh is now functioning as a narrow-gauge road, although the roadbed is constructed for broad gauge, which will eventually be used. Construction is actively proceeding.

ROADS

The Turkish roads are few and in general bad.

In European Turkey the following roads are metalled: Adrianople-Baba-Eski and Chorlu-Constantinople; Adrianople-Kirk-Kilisse-Iniada; Baba-Eski-Kirk-Kilisse; Gallipoli-Uzun-Kopru-Demotika; Rodosto-Keehan-Ferejik; Rodosto-Muradli; Buyuk Chekmeje-Derkos.

The remaining roads in Turkey-in-Europe are only cart tracks or bridle paths.

In Turkey-in-Asia there are two trunk routes leading to the Bosphorus, one from Armenia through Angora, the other from Syria through the Cilician Gates and Konia.

The vilayets of the western region, Smyrna and Brussa, are the only ones provided with anything like a sufficient system of carriage routes.

The great Bagdad highway extending from Samsoun to Bagdad via Sivas-Kharput-Diarbekr and Mosul is in poor repair.

There are great caravan routes connecting the Black Sea ports with Alexandretta, and Tabriz, and tapping the important centers of Kurdestan, Armenia, and Anatolia. These are supplemented by various trails suitable only to pack animals. In general there is no system of roads or railways adequate to facilitate the internal commerce between Provinces or to transport the produce of the interior to the ports. Transportation by caravan is slow and expensive.

WATER

None of the rivers are suitable for transportation except in some instances by small craft for short distances. Numerous rivers are used for floating timber.

Telegraph.—The telegraph lines of Asia Minor and Trans-Caucasia are under Government control excepting one line—Constantinople to Cairo via Yozgat, Adana, Beirut, and Jaffa—which belongs to the Eastern Telegraph Company, Ltd., a British concern.

From Constantinople, there are the following direct telegraph lines:

Constantinople to Fao, in the Gulf of Persia, via Angora, Sivas, and Bagdad, a semidirect line paralleling this line as far as Divanie, which is a short distance south of Bagdad. From Divanie there is a projected semidirect line to Fao. All along this direct and semidirect line there are short branches connecting all near-by cities and towns.

A direct line from Constantinople to Fao, via Afium Karahissar, Konia, Adana, Aleppo, and Bagdad.

Constantinople to Batum via Kastamouni, Samsoun, and Trebizond. Paralleling this Batum line is a semidirect line from which branches connect with near-by cities and towns along the line.

Constantinople to d'El-arish, via Afium Karahissar, Konia, Adana, Alexandretta, Beirut, and Jaffa. From this direct line there is a branch from Beirut to Aleppo, one from Beirut to Damascus, one from Jaffa to Jerusalem, one from Port Said to Suez, and one from Cairo to Alexandria. In addition to these direct lines, there is a semidirect line paralleling, having branches to various towns and cities along the line. This direct line is cross-connected with the Constantinople to Fao line by a line from Latakia to Diarbekr, via Aleppo.

Telephone.—The only public telephone systems in Turkey-in-Europe and Turkey-in-Asia are those in Constantinople and Smyrna. A few other large cities have local government lines used only by the police. Before the war there was a private telephone wire from Constantinople to Vienna which was installed and maintained by the Austrian Government.

In general, it may be said that there is no telephone system in Asiatic Turkey, but it will necessarily accompany new railroad construction.

Cable.—There is a cable from Constantinople to the Dardanelles, from which place there is a direct telegraph line to Marmariss.

There is a cable from the Dardanelles to Tenedos, from which place a cable goes direct to Saloniki, and one to the Island of Chios, the latter being connected with Smyrna by cable via Tchesme.

There is a cable from the Island of Vati to Schalamova.

There is a cable from Marmariss to the Island of Rhodes, from which place a cable goes to Sitia, on the Island of Candia, thence to Alexandria.

There is a cable from Latekia to the Island of Cyprus, from which place a cable goes direct to Alexandria, Egypt.

There is a cable from Constantinople to Odessa.

There is a cable from Constantinople to Custendje, Bulgaria.

There is a cable from Constantinople to Constanza, Rumania.

Radio.—There is a powerful wireless station at Constantinople. Also a station at Karsanje in Anatolia.

FUTURE DEVELOPMENT

The obstructions to economic development are first and foremost lack of money. Turkey has been bled white during the past 10 years and has urgent need of capital to rehabilitate the country. The inadequate railway lines must be extended, ports and harbors must be improved, agricultural implements and machinery must be imported, and a backward population must be instructed in their use as well as in modern methods of farming. The greatest problem confronting the Turkish State is to induce foreign capital to come into Turkey under the present conditions. Whereas formerly foreign capital flowed into Turkey in connection with concessions which were guaranteed under conditions which resulted in the economic slavery of Turkey to the Powers, the present Turkish policy is to refuse any concessions the terms of which infringe in any way upon the political or economic freedom of Turkey. Capital has not as yet shown sufficient confidence in the stability and fair dealing of the present Government to make any extensive investments. The rate of economic development is absolutely dependent upon the influx of foreign capital. The plans of the leaders of the Government are sound, as the announced policy is to further in every way the economic development of the land by bringing in foreign advisers, by establishing schools for agricultural instruction, by establishing agricultural credits, by constructing railways, and through irrigation projects. All this requires capital, and the Turk is resolved to relinquish no political rights in return for foreign cash. If in the last analysis he is obliged to proceed without foreign capital, the economic advance will be very slow, just as would that of an impoverished estate attempting rehabilitation through its own resources, without loans. In spite of the widely spread belief that the Turk is economically incapable, such is not the truth. He is economically untrained on account of the circumstances of historical development but possesses the native qualities of patience, endurance, and intelligence which will bring success.

UNITED STATES

AN OUTLINE OF A COMPREHENSIVE WAR OPERATING PLAN—PREPARED AND SUCCESSFULLY EXECUTED BY AN AMERICAN COMMANDER IN CHIEF

General Grant's Campaign of 1864

I. The Basic Plan

The General Concept.—To merge the whole United States Army into two, or at the most three, large armies and to offensively employ these as so many units simultaneously and continually against the armed forces of the enemy: selecting, so far as possible, for all efforts Lee's Army as the one common center and aim.—Badeau, Vol. II.

Missions, initial operations, and general instructions:

In Field, Culpeper Courthouse, Va.,
April 9, 1864.

Major General G. G. Meade,
Commanding Army of the Potomac.

For information, and as instructions to govern your preparations for the coming campaign, the following is communicated, confidential, for your own perusal alone.

So far as practicable, all the armies are to move together and towards one common center. Banks has been instructed to turn over the guarding of the Red River to General Steele and the Navy; to abandon Texas, with the exception of the Rio Grande, and to concentrate all the force he can, not less than 25,000 men, to move on Mobile. This he is to do without reference to other movements. From the scattered condition of his command, however, he can not possibly get it together to leave New Orleans before the 1st of May, if so soon. Sherman will move at the same time you do, or two or three days in advance, Jo. Johnston's army being his objective point and the heart of Georgia his ultimate aim. If successful, he will secure the line from Chattanooga to Mobile, with the aid of Banks. Sigel can not spare troops from his army to reinforce either of the great armies; but he can aid them by moving directly to his front. This he has been directed to do, and is now making preparations for it. Two columns of his command will make south at the same time with the general move; one from Beverly, from 10,000 to 12,000 strong, under Major General Ord; the other from Charleston, Virginia, principally cavalry, under Brigadier General Crook. The former of these will endeavor to reach the Tennessee and Virginia railroad about south of Covington, and if found practicable, will work eastward to Lynchburg, and return to its base by way of the Shenandoah Valley, or join you. The other will strike at Saltville, Virginia, and come eastward to join Ord. The cavalry from Ord's command will try to force a passage southward, if they are successful in reaching the Virginia and Tennessee railroad, to cut the main lines of the road connecting Richmond with all the South and Southwest.

Gillmore will join Butler with about 10,000 men from South Carolina. Butler can reduce his garrison so as to take 23,000 men into the field directly to his front. The force will be commanded by Major-General W. F. Smith. With Smith and Gillmore, Butler will seize City Point and operate against Richmond from the south side of the river. His movement will be simultaneous with yours. Lee's army will be your objective point. Wherever Lee goes, there you will go also. The only point upon which I am now in doubt is whether it will be better to cross the Rapidan above or below him. Each

plan presents great advantages over the other, with corresponding objections. By crossing above, Lee is cut off from all chance of ignoring Richmond and going north on a raid. But if we take this route, all we do must be done whilst the rations we start with hold out. We separate from Butler, so that he can not be directed how to cooperate. By the other route, Brandy station can be used as a base of supplies until another is secured on the York or James Rivers.

These advantages and objections I will talk over with you more fully than I can write them.

Burnside, with a force of probably 25,000 men, will reinforce you. Immediately upon his arrival, which will be shortly after the 20th inst., I will give him the defence of the road from Bull Run as far south as we wish to hold it. This will enable you to collect all your strength about Brandy station, and to the front.

There will be naval cooperation on the James River, and transports and ferries will be provided; so that should Lee fall back into his entrenchments at Richmond, Butler's force and yours will be a unit, or at least can be made to act as such. What I would direct, then, is that you commence at once reducing baggage to the very lowest possible standard. Two wagons to a regiment of 500 men is the greatest number that should be allowed for all baggage exclusive of subsistence stores and ordnance stores. One wagon to brigade and one to division headquarters is sufficient, and about two to corps headquarters.

Should by Lee's right flank be our route, you will want to make arrangements for having supplies of all sorts promptly forwarded to White House, on the Pamunkey. Your estimates for this contingency should be made at once. If not wanted there, there is every probability they will be wanted on the James River, or elsewhere.

If Lee's left is turned, large provision will have to be made for ordnance stores. I would say, not much short of five hundred rounds of infantry ammunition would do. By the other, half the amount would be sufficient.

U. S. Grant, *Lieut.-General.*

II. Contributary Plans

The more distant commanders, however, Grant meant to leave, in all the details of their operations, quite as untrammelled as he himself had hitherto been. He, indeed, assigned them their objective points and their armies; told them what they were to do, and gave them the means with which to do it; but the use of those means, the accumulation of their own supplies, the tactics of their battles, and in some degree the strategy of their own campaigns—these were left to each commander's judgment. When officers of the highest rank were acting under his own eye, he felt himself entirely responsible, and whether it was Sherman, or Sheridan, or Thomas, or Meade, invariably directed even detailed movements, and never found his great subordinates object to such a course; but those whom he entrusted with separate commands, he deemed it unadvisable to hamper with minute instructions. Each man's individual genius was thus developed and each man's proper pride aroused. "I do not propose," he said to Sherman, "to lay down for you a plan of campaign, but simply to lay down the work it is desirable to have done, and leave you free to execute in your own way. Submit to me, however, as early as you can, your plan of operations."—Badeau.

In such matters (i. e., organization within the different armies) he (Grant) desired to leave his important commanders very nearly independent. All was indeed, eventually submitted to him, but he seldom overruled the detailed plans of those to whom great trusts were confided.—Badeau.

III. Actuating Despatches

2–3 May, 1864.

To Sherman.—"Move at the time indicated in my instructions. All will strike together."

To Butler.—"Start on the date given in my letter. There will be no delay with this army."

To Meade.—"You will move according to the orders issued. Burnside knows the fact."

To Burnside.—"All of Meade's troops will be away from Brandy station to-morrow morning."

IV. Secrecy of Plan

The outlines of this plan were communicated only to Grant's most important or most trusted subordinates. As has been seen, they were not divulged even to the Government, and the Government was content to remain uninformed. Meade and Butler necessarily received explicit instructions and learned the relations which the campaign of each would bear, not only to the other's movements, but to the general scheme. Sigel and Banks also were apprised very fully of the part they were to perform, while Sherman, of course, was in full confidence of his chief. To no others, except to members of his personal staff, did Grant impart a knowledge of his plans; and, even among these, there were some with whom he was reticent.—Badeau.

V. Unity Within the War Department

Halleck to remain at the War Department because "There must be some military head here to keep things from getting into a snarl. There must be some common head here to make the different bureaux act in concert and with promptness. It is impossible for the Secretary or his attendants to attend personally to these matters."—Halleck to Grant.

VI. The Presidential Approval

Executive Mansion,
Washington, April 30, 1864.

Lieutenant-General Grant:

Not expecting to see you again before the spring campaign opens, I wish to express in this way, my entire satisfaction with what you have done up to this time, so far as I understand it. The particulars of your plans I neither know nor seek to know. You are vigilant and self-reliant; and, pleased with this, I wish not to obtrude any constraints or restraints upon you. While I am very anxious that any great disaster or the capture of our men in great numbers shall be avoided, I know these points are less likely to escape your attention than they would be mine. If there is anything wanting which is within my power to give, do not fail to let me know it.

And now with a brave army and a just cause, may God sustain you.

Yours very truly,

A. Lincoln.

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OFFICE OF NAVAL INTELLIGENCE
NAVY DEPARTMENT
Washington, D. C.

MONTHLY INFORMATION BULLETIN

NUMBER 6—1924

JUNE, 1924

DISTRIBUTION

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines

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MONTHLY INFORMATION BULLETIN

NUMBER 6—1924—JUNE, 1924

FOR CONVENIENCE IN ROUTING

Officer	Initials	Date received	Date forwarded
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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NEW SPANISH LIGHT CRUISER "REINA VICTORIA EUGENIA"

JAPAN

KASUMIGAURA NAVAL AIR TRAINING STATION

April, 1924

The Kasumigaura Naval Training Station is located on the western shore of Lake Kasumigaura and about 3 miles south of Tsuchiura, a railroad station about 40 miles north of Tokyo, on the Joban Line. The flying field is an excellent one, being about 1½ miles square and very smooth, without grass or sod. The seaplane station, constructed about 1922, consists of six temporary hangars with wooden frames covered with canvas. In front of these hangars are three concrete slipways running into the water. There are several small office buildings and storage houses, all of wooden construction. Two steel hangars under construction are expected to be completed early in May. There are also several large brick and steel hangars for housing airplanes, a two-story permanent administration building, a permanent repair shop, a permanent machine shop, and a large balloon hangar. Two large steel masts for high-powered wireless stations are being erected. A number of planes were seen. Two-seated Avro biplanes made in England and equipped with 80-horsepower Lerhone engines are used for preliminary training. The seaplanes are two-seated biplanes equipped with 200-horsepower Hispano Suiza engines, made in Japan. These seaplanes have two floats of very heavy construction and seem well suited for advanced training, for which they are used. A Japanese officer stated that the seaplanes were of a design six years old, that no more were being made, and that an improved type would be used as soon as the old planes are worn out. A plane of the improved type, which was being hauled into the water looked more like the old type and is equipped with the same engine. Several Avro seaplanes were being used for training. These were the same as the land machines, except that pontoons have been substituted for wheels. Japanese officers stated that they did not like the 200-horsepower Hispano engines because they are not reliable. In addition to the Avros, there are a number of pursuit planes. These are evidently a training type and look very much like the old Thomas Morse scout planes, except that they are equipped with 300-horsepower Hispano engines. Several of this type were flying and did not appear to be very fast, their maximum speed being probably between 120 and 130 miles per hour. They are,

however, very solidly constructed and seem to be sturdy machines. The torpedo planes are biplanes with about a 65-foot wing spread and are equipped with 450-horsepower Napier Lion engines. Several of these were flying and appeared to have a speed of about 85 to 90 miles an hour. They seemed designed to carry at least one naval-type torpedo. Several of the hangars were visited, and all seemed well stocked with new machines which have not been set up.

Evidently the Japanese do not intend to purchase many more foreign-made airplanes. The general design of all the types of Japanese-made airplanes observed seems to be an adaptation of French, British, and German designs. The fuselage in front of the fire wall on all of the types of Japanese-made airplanes is constructed of tubular steel with welded joints. Some of the planes had fuselages entirely constructed of steel tubes. The majority, however, had wooden longerons. The engines were installed in the fuselages in such a manner as to be readily accessible.

One of the Japanese officers explained the system of training in use. The course lasts one year. During the first three and a half months all officers undergoing training are taught to fly Avro planes. At the present time there are 40 students undergoing training on these planes at this station. At the end of three and a half months training on the Avros the students are then divided into two classes, one class beginning advanced training on seaplanes and flying boats, and the other class begins training on pursuit, reconnaissance, or torpedo planes. The Japanese officer stated that the present system of training is going to be discontinued in the near future, and that instead of teaching students to fly land machines first they were going to teach them to fly seaplanes first. Officers undergoing advanced training on pursuit, reconnaissance, or torpedo planes are being trained to fly these types from the decks of airplane carriers. The Japanese officers stated that they had not been successful in landing the torpedo planes or reconnaissance machines on the decks of carriers, but they had experienced no difficulties with the small pursuit planes.

Japanese officers stated further that all instructions are done in the morning: that there is no flying in the afternoon, except for the purpose of testing or experimenting.

JAPAN

MISCELLANEOUS NAVAL NOTES

April–May, 1924

From Japanese press:

Submarine *No. 22*, belonging to the submarine training school at Kure, while returning from a fish torpedo practice in Hiroshima Bay to the naval port on the morning of April 28, came into collision with the special service ship *Ondo*. The submarine had her bow badly damaged and the *Ondo* also had her side severely damaged. Both sprang a leak and were on the point of foundering, but were saved by the desperate efforts of the salving parties which hastened to their rescue.

While engaged in torpedo practice early that morning in Hiroshima Bay one of the bluejackets of the submarine was killed by a projectile discharged from the torpedo tube of the submarine. On account of the mishap the submarine was returning to the naval port when she collided with the *Ondo*, which was riding at anchor off Kure.

It has been decided to accord those who die on board submarines in the performance of duty the same benefits as those who are killed in aviation accidents, and this plan will be carried out as soon as approved by the finance department.

This provision refers to granting of "protection money" in the sum of ¥10,000 in the case of officers, ¥4,000 to petty officers and ¥3,000 to the men. In addition to the above, a lump sum called the "death great" will be paid, ¥4,000 in the case of officers, sublieutenant, second grade, to lieutenant, and ¥1,000 to the men.

The second destroyer squadron while on the way to Sasebo on April 15, the *Yukaze*, of the second division, and the *Tachikaze*, of the fourth division, collided, the bow of the *Tachikaze* striking the stern of the *Yukaze* on the port side. There were no casualties.

The newly organized second submarine flotilla under Rear Admiral Kawai, flagship *Hirato*, tender *Karasaki*, the fourteenth division, *Nos. 45, 58*, and *62*, and the twenty-sixth division, *Nos. 59, 68*, and *72*, will be engaged in various maneuvers in the Inland Sea till about the middle of May and then will cruise around Taiwan and South Sea Islands to undergo heat-resisting training. These submarines are all new boats and this will be their first trial in tropical waters.

The flotilla will join other ships in the south to participate in the grand maneuvers.

Three navy flyers narrowly escaped death April 29, when their airplane dropped into the sea at Yokosuka. The men were picked up by the rescuers from the flying corps.

Submarines are liable to be detected unless they submerge over 60 feet below the water surface. However, it was h therto thought that a submarine when submerging to a greater depth than 60 feet would be liable to be crushed by water pressure. This, however, can be prevented by a partial reconstruction of the hull, and submarine *No. 24* and four others belonging to the submarine school at Beppu-wan, after reconstruction of hull, succeeded in making cruise at depth of 75 feet, making a new record for the Japanese Navy.

NOTE.—No details of the above reconstruction have been obtained, and whether or not 75 feet is their maximum depth has not been confirmed, but it is believed that the boats are tested to 200 feet.

The submarine *No. 43* was put into dry dock for repairs, and the following parts were found to be damaged: Periscope, outer shell of conning tower, telephone receiving tube, Kingston valve.

The cause of the damage to the Kingston valve has not yet been determined.

A board of inquiry will determine whether the accident was due to the handling of the cruiser *Tatsuta* or carelessness in the handling of the submarine.

She will be turned over to the defense corps on April 28, at which time it will be decided whether or not she will be decommissioned.

In the case of the *Naka*, then under construction at Yokohama Dockyard, and damaged by the earthquake of September 1, 1923, the Navy has decided to bear half of the loss which is ¥1,300,000.

According to the Manila Times, 97 Army airplanes arrived at Manila on the transport *Meade*. Increases in the number of men stationed at Camp Stotsenburg have also been made.

This is likely to raise the question as to whether or not this violates the limitation placed on defense of this part of the Pacific. When there was a rumor that the United States Navy was going to reconstruct one of the colliers belonging to the Asiatic Fleet for the purpose of carrying airplanes, some defended the plan, stating that to place airplanes on depot ships in no way conflicts with the limitation placed by the treaty on shore defense. While such may be the case, in a way it certainly is not in harmony with the spirit of the treaty. The present case is far more serious than the above, for, to increase the Army planes by over 90 and to increase aviation equipments at Camp Stotsenburg are certainly acts of increasing the defenses of Manila.

It is said that while discussing the question of limitation of Pacific defenses at the Washington conference, suggestion was made to exclude the question of airplanes, but such is not even recorded in the official minutes; at any rate a treaty like the Washington treaty can not attain the desired ends when it is merely adhered to by the letter of the treaty, it being necessary to respect the very spirit if we are to expect anything out of it.

The distance from the northern end of Luzon to the island of Taiwan is only 250 miles, and, should the aviation stations in Manila be strengthened one after the other, it certainly is a menace to the safety of our shore.

In order to cope with the increasing demand for crude oil the naval authorities have decided to establish heavy oil tanks in Tokuyama near Shimonoseki and Maidzuru. The former one has been completed. Early in June about 150 men are to be sent to Maidzuru from Kure for the construction.

Supplies enough to last the Navy three or four years were lost at Yokosuka in the earthquake, some burning and a great deal more floating out to sea. Maidzuru was a naval port, but is supposed to have been reduced to the status of a mere depot. The construction of oil tanks will revive its importance.

The *Isuzu*, while off the coast of Kagoshima, had trouble with her engines and proceeded and arrived at Kure on April 4. She was expected to leave again April 5 for Ariake-wan to join the fleet.

The light cruiser *Tama* had trouble with her engines and was forced to return from Yu-u to Kure on March 16.

The light cruiser *Yubari*, built at Sasebo last year, recently while cruising along the Chinese coast, but finding trouble in some part of the ship, was forced to leave the fleet and return to Sasebo, which port she reached on March 28. She was inspected at the navy yard, repairs were made, and she went out for a trial run, but the same peculiar sounds were heard along the sides of the ship while under way, and the engine stopped when trying to attain high speed. The cause of the trouble has not been determined, and the technical department has been requested to send experts to investigate the cause of the trouble.

Submarine *No. 45*, which was at the Sasebo Naval Arsenal, is expected to reach Kure shortly. She is to join the newly organized Second Submarine Flotilla, Fourteenth Division, on April 1, together with *No 58*, equipped at the Yokosuka Naval Arsenal, which is expected shortly at Kure, and submarine *No. 62*, now at Kure.

The present Japanese aviation program intends to have 17 corps by the fiscal year 1927 (in Kasumigaura, Yokosuka, Sasebo, and Omura).

In accordance with this program, it was intended during the fiscal year 1924 to add two and a half corps, but on account of a decrease in appropriation only one corps will be added this year. It has been decided to establish a new station in Chinkai, and this one corps will be stationed in Chinkai.

The *Hayatomo*, which was built at Kure, will be finished, with her official trials, by the end of April, when she will be turned over to the Navy Department and proceed to Sasebo, to which station she will be attached.

Her officers are as follows: Commander K. Aoki, commanding; Lieutenant Commander K. Ozawa, executive; Lieutenant Commander (engineer) M. Miyano-o, chief engineer; Lieutenant S. Soma, navigator.

On April 14 an airplane piloted by Sergeants Kawakami and Kendo, of the Kasumigaura Naval Aviation Corps, fell from an altitude of about 200 meters, on account of the motor stopping, at Kimihara-mura in Ibaraki Prefecture, and

the two aviators were seriously injured. They are, however, likely to recover. The aviators were conducting wireless experiments.

Two navy airplanes belonging to the Kure Naval Station, which started from Konagen April 12 for Formosa, arrived at Keelung Monday noon. The two planes were forced to land on one of the islands in Yaeyama Archipelago by a sudden change of weather. After a replenishment of fuel, the planes attempted to continue the trip, but were forced to stay on the island overnight due to the prevailing bad weather.

A submarine tender to be known as *Chogei* was launched at the Mitsubishi Shipbuilding Yards at Nagasaki on March 24, 1924. This ship is a sister ship of the *Jingei* launched May 4, 1923. The following particulars regarding the new vessel have been published:

Displacement	tons	8,500
Length	feet	380
Breadth	do	35
Draugth	do	23

The vessel is to have a speed of 16 knots, delivered by two engines. It will be equipped with four guns of 0.14 meter size. The vessel will be fully equipped and ready for commission before autumn of this year.

On March 30, 1924, while engaged in practice of towing, the *Nagato* was to tow the *Mutsu*; the port-side bow of the *Nagato* rubbed against the *Mutsu* on the starboard side amidships, and both ships sustained slight damage.

The accident will cause no change in their schedule, and repairs will be made when the ships return to their home ports in May.

To protect the Japanese fishing industry and patrol northern waters, it has been decided to send the Ninth Destroyer Division (*Maki, Kuwa, Tsubaki,* and *Kayaki*), of Ominato station, and the Eighteenth Destroyer Division (*Tokitsukaze, Amatsukaze, and Isokaze*), of Kure Station, the Ninth Destroyer Division to be assigned to duty around northern Karafuto, and the Eighteenth Division to patrol Kamchatka and Kurile Islands.

These destroyers will go north the latter part of April, at which time the ice crusher *Otomari* returns home.

JAPAN

OIL SUPPLY FOR THE NAVY

May, 1924

The Associated Press correspondent in Tokyo had an interview with the senior aid to the Minister of Marine on the subject of conversion of coal-burning capital ships to oil burners, and he was told that when it becomes necessary to refit the boilers of the older battle cruisers *Kongo* and *Hiyei*, each 12 years old and the oldest of the capital ships retained by treaty, the authorities contemplate

converting them to oil burners, and that it is also contemplated that when the other capital ships reach the same age they will be converted.

In connection with the above, a reliable person stated that he was told by a Japanese engineer-commander that the Japanese naval authorities are contemplating converting all their coal-burning capital ships to oil burners.

It has been a matter of general knowledge that Japanese naval authorities have been seriously concerned with the question of naval fuel-oil resources, and the fact that all their capital ships burn either coal or oil indicates clearly that in the past they have not dared to put all their eggs in one basket by building exclusively oil-burning ships, as the above statement indicates they are now undertaking to do.

The question naturally arises: In what manner has Japan solved the question of fuel oil sufficiently to warrant conversion of her capital ships, and the answer appears to be contained in the promise of oil from the fields of northern Saghalien and the oil-shale deposits of the Fushun coal mines in south Manchuria, under the control of the South Manchurian Railway.

There has been considerable difficulty in obtaining reliable information on the value of the Saghalien proposition, as it is involved in the Russo-Japanese negotiations, as will be explained later, but it is strongly believed that the prospects of fuel in that territory represent the mainstay of Japan's future oil resources. The vice president of the Okura Co., which has invested in the Saghalien field, stated that they are drilling and have found oil. He would not, however, indicate the richness of the field, but he said its value would be a source of difficulty in negotiations with Russia.

The company which is doing the prospecting in Saghalien is a Japanese corporation called the North Star Co., formed by a combination of such wealthy and influential interests as the Mitsui, Mitsubishi, Kuhara, Suzuki, and Okura corporations, and capitalized at ¥3,000,000, has been surveying the Saghalien field. The combine has obtained at least ¥2,000,000 in subsidies from the navy. The preliminary surveys are said to have been satisfactory; drilling machinery was landed recently in the island, and the company expects to begin to take out oil this year. Next year is expected to see large-scale production from these wells.

The nominal Russian title to northern Saghalien, which the Japanese Government does not question, presents an obstacle to the designs of the navy and the North Star Co., but not an insuperable one, it is believed in well-informed circles. The Japanese Army has held northern Saghalien since June, 1920, as a guaranty of

satisfactory indemnification by Russia for the massacre of 700 Japanese by Russian partisans at Nikolaievsk, at the mouth of the Amur River, Siberia, in March, 1920. When A. A. Joffe, envoy of the Moscow Government, was negotiating with the Japanese in Tokyo last summer, the purchase of northern Saghalien by Japan was discussed, but Joffe named a price which the Japanese considered exorbitant, and the negotiations fell through.

It is no secret that the navy, one of the most influential elements in Japanese politics, will oppose to the end any settlement with Russia that does not leave Japan in possession of northern Saghalien, or at least grant concessions in the oil fields that would preserve those resources for the Japanese Navy. Whenever Japan and Russia come to a real conference for the composition of the differences that still estrange them diplomatically, Saghalien is sure to be one of the most critical subjects to be discussed. The fate of the negotiations is likely to hang on this point. No matter how much the foreign office would like to see the Nikolaievsk-Saghalien question solved, it would hardly dare make an arrangement that would outrage the navy or the great financial groups interested in the exploitation of the Saghalien oil fields.

The recent expulsion from northern Saghalien of two American oil surveyers, representing the Sinclair Co., illustrated the determination of the Japanese authorities to keep the Saghalien preserves for their own. The Sinclair men, intending to survey the fields in which Sinclair holds a concession granted by the now defunct far eastern republic of Chita and later affirmed by the Moscow Soviet, were informed that the Japanese authorities do not recognize any grants made by the present Russian régime, and that the Japanese military occupation is the supreme authority in northern Saghalien for the present.

The shale deposits of the South Manchuria Co. are to be regarded as a reserve rather than an immediate source of supply for the present. Oil men generally agree that it is impossible for oil to be distilled from shale at a cost permitting competition in the present markets. However, Takeji Kawamura, president of the South Manchuria Railway Co., spent the first half of April in Tokyo conferring with the Ministers of the Navy and of Finance over the oil-shale proposition. On returning to the headquarters of the railway in Dairen, he told Japanese newspaper men, it is claimed, that he had obtained the approval of the Minister of Finance for the flotation of a foreign loan of ¥60,000,000 for the exploitation of the Fushun mine shale. This can not be confirmed in Tokyo. Much publicity, however, has been given the Fushun shale proposition, the railway experts who have been conducting experiments with the

shale for three years claiming that the shale promises a higher yield of crude oil than any other known in the world. They also claim that it will be possible for the deposit at the Fushun mines to yield 700,000 tons of crude oil a year when fully developed, an amount 70 per cent of the present total annual consumption of Japan. British and American oil men in Japan regard the Japanese estimates as overoptimistic, but admit the possibilities of the Manchurian shale deposits.

It is understood by the Japanese press that Mr. Kawamura also asked the navy for a subsidy of 5,000,000 yen for immediate work on the shale project, but with what success is not known.

JAPAN

PRESENT CONDITION OF BONIN ISLANDS

April, 1924

The following report was recently obtained. Informant seems to be a remarkably observant man, and he stated that as at one time he had been in the army he had particularly noticed any attempts at fortifications and was especially interested in the strategic value of the islands. He reiterated over and over again that he thought that if the islands were properly fortified and developed as a naval base and if the sending of supplies from the mainland could be maintained, that a fleet operating from there could control the entire South Seas and all the waters north of Singapore. He further said that had he been a Japanese he would have fought the abandonment of the fortifications of these islands, and to his mind the fact that fortifications had been abandoned was one of the clearest proofs of the hearty desire of these people to avoid war.

Chichijima, the main island of this group, was first settled by a group of American and English adventurers from Hawaii, headed by Nathaniel Savory, most of whom brought Kanaka wives. This group was augmented from time to time by Germans and Portuguese from China and Macao, who for the most part brought native wives with them. The common language came to be English, which is even yet used by the descendants of these people, who boast in title of white man and are still headed by a descendant of Nathaniel Savory, of Massachusetts. The recent Japanese immigrants now, however, greatly outnumber these early settlers.

The principal town, called by the Japanese Chichi, is situated on the only harbor in the whole group. This harbor, however, is a very good, fairly large sized, land-locked harbor, offering protec-

tion in all seasons and weathers. The channel is plenty wide, but seems a bit tortuous, as two or three turns must be made in entering. Hills rise sharply from the harbor, which is roughly in the shape of an ellipse, about 2½ miles wide by 2 miles long. The largest ships can enter and find anchorage, but no ocean-going ship can approach closer than about one-eighth mile to the shore except at one place called Ten Fathom Hole, where they can run right in to the beach, and here is located a small wooden dock which is used by whalers. Other ships land their passengers and freight by means of small boats and barges. A commercial shipping company, known as the Kinkai Yusen Kaisha, a subsidiary of the Nippon Yusen Kaisha, runs a monthly boat schedule to Chichijima. Every other month these boats go on to Hahajima, another island, but as there is only an open roadstead at this latter place they come back to Chichi as soon as possible. Two fairly comfortable steamers of about 3,000 tons displacement are used to maintain this service.

With the exception of the small pier at Ten Fathom Hole and a very limited number of barges and small boats, there are no docks or landing facilities whatever. There are no shops or facilities for repairs of any kind and no materials for repairs can be obtained. The only marine fuel on the island is a small amount of coal, which is used in the power plant of the little factory which converts blubber into whale oil, and which is situated at the head of the pier at Ten Fathom Hole.

The island in its natural features is almost a fortification already, and could be very easily and very quickly fortified, provided all materials and supplies, including food and labor, were or could be sent there. The Japanese had begun the fortification of this island before the Washington conference, but had only progressed to the extent of leveling sites and cutting roads; two of what appear to have been intended to be bombproofs had, however, already been built. These are built into the side of the hill and are of concrete. One is complete, while the other one is only partially so. There are no gun emplacements of any kind whatsoever and no system of communications. There are no barracks or similar structures of any kind except one or two dilapidated wooden structures which were formerly used to house laborers while construction was going on. All the laborers and all materials, even down to the cement, which were to be used in constructing the forts have been sent back. There are no munitions or any such materials of any kind in storage or otherwise.

There is a lieutenant colonel, a major, a captain, a sergeant, and eight men stationed on the island who have charge of conscription work, etc., for the Japanese Army. They also have the administra-

tion and policing and preservation of the sites for the forts, for which purpose about four coolies are hired.

There is a naval radio station on the island, with a lieutenant in charge and a naval operating personnel of about 8 or 10 men. This station is powerful enough to maintain radio communications with Tokyo, and is useful in ordinary times as a weather reporting station. It, however, would be invaluable in war in sending advance information in regard to the enemy and in keeping in touch with their own scouts and commerce destroyers. While it is true that very extensive works, such as building dry docks, shops, ammunition and supply depots, etc., which would necessarily require a number of years for completion, would be necessary to turn this place into a proper base; it is unsurpassed as a temporary base for scouting and commerce-destroying operations and as a shelter in bad weather. Used in this way, it would control commerce in the entire South Sea area. In considering these facts, however, the point which must be consistently borne in mind is that all supplies of whatever nature would have to be shipped from Japan (a distance of some 532 miles), as the island can not even feed its own inhabitants.

There are no facilities for aircraft.

Excellent maps and a description of the island may be obtained from Constable, London. This book is known as "History of the Bonin Islands," by Rev. L. B. Cholmondley, who lived there for a number of years.

While it is realized that the above report is vague in some respects, especially in regard to depth of water and number of big ships, etc., which might be accommodated, it can hardly be expected that a man of limited knowledge regarding the requirements of ships, etc., could furnish any definite information on these points.

FRANCE

ESTIMATE OF THE ECONOMIC-MILITARY SITUATION

May, 1924

[Prepared by the War Department, Military Intelligence Division]

1. GENERAL ECONOMIC CHARACTERISTICS

France is commercially and industrially sound. Reconstruction of industrial activities damaged and destroyed in the war, the advance of industrial organization, and cooperation or consolidation have given to France a revived, enlarged, and bettered industrial plant. Water power is being systematically developed and will lessen the need for coal consumption. Agricultural rehabilitation has similarly pro

gressed, and areas cultivated in principal crops will soon equal the pre-war fields. Foreign trade constantly improves, and the trade balance becomes less unfavorable. Railroads now operate at a profit and returns from taxation are in greater volume. The country is prosperous and unemployment does not exist.

However, immense war losses and debts and expenditures in rehabilitating devastated regions, coupled with failure to realize anticipated reparations, fix upon the nation a burden under which for years it will be necessary to struggle. Payment of foreign debts due France can not be considered in any scheme of financial readjustment. And, on the other hand, the huge amounts due by France to the United States and Great Britain, though they remain unfunded and at present are not an actual drain upon the national treasury, have to be taken into account in a discussion of the financial condition. While repudiation has not been suggested, cancellation in whole or in part has received frequent mention; in the present uncertain political situation the placing of such debts upon an interest-paying basis would bring an additional burden upon French finances most unwelcome to the people generally and difficult to incorporate in the budgets.

2. PRODUCTION

(*a*) *Food.*—The normal production of foodstuffs in the average years prior to the World War was practically adequate for the physiological needs of the country. The invasion and devastation of large arable areas and their disuse during the war, together with losses by capture and unusual slaughtering in cattle, reduced production whereby heavy imports were a necessity; subsequently, rehabilitation of fields, with renewal of implements and housing accommodations, and reconstruction of herds have not progressed to an extent making production sufficient for actual requirements of the population. Dependence upon imports at present is estimated to be about 10 per cent. This dependence is diminishing steadily with the accretions to herds. With the bringing of other areas to agricultural use (coupled with better practice in cultivation), and added development of fisheries; in a relatively short period, based upon statistics of former home production, the nation should again become self-sustaining.

In the event of war, while not fully on a production basis prevailing prior to the World War, France can, with some deprivation, subsist her armies and other population upon foodstuffs raised or produced within her borders; if communication by sea with her possessions be maintained her task in subsistence would be facili-

tated. She would be able to supply little during such period for export or in aid of allies.

(*b*) *Raw materials.*—Iron and steel, beauxite, and potash are produced in quantities far beyond any possible peace or war needs and are important commodities of export. In coal and coke, so requisite for her industrial development, especially the metallurgical, France lacks in adequate home resources, and will continue to do so even when her own mines shall again be completely reconstructed and with the addition of output from the Saare fields. In control of the Ruhr region and with normal output therefrom, the fuel needs will be amply supplied. The lack of coal, especially of a variety producing coke, is a source of anxiety to France and tends to restrict the fullest development of the newly acquired metallurgical industry and iron ore mines of Lorraine. The relatively scant production of coal is, in great measure, the urge in the general water-power development being undertaken.

Hides production for leather making, except in heavy steer variety, is inadequate to supply demands. The colonies in Africa are increasingly becoming the source from which to import.

Raw cotton in full quantity needed must be imported from foreign sources.

Rubber supply is dependent upon foreign purchases, although some not fully developed resources exist in the African possessions.

Chemical materials, other than potash and salt, exist in only very limited quantities. Pyrites chiefly come from Spain. Nitrates largely come from Chile, although fixation plants for the obtaining of nitrogen from the air are being developed and may be expected, in emergency, to render France independent of foreign sources. Bromine in apparently inexhaustible quantity is obtainable from Tunisia.

Manganese must almost entirely be obtained abroad.

Chromium exists in ample quantity for France in New Caledonia.

Petroleum, oil shale, and natural gas are found in relatively small amounts, and France is as yet almost destitute in such materials.

Phosphates are found in great supply in Algeria and Tunis.

Copper only in insignificant quantities is found in France or, as yet, in her colonies.

Lead comes chiefly from Tunis and Algeria, with little found in France proper.

Zinc is obtained at home and in North African colonies.

Nickel comes from New Caledonia and Madagascar.

Tungsten is brought entirely from abroad.

Vanadium must be obtained from Peru or the United States.

Molybdenum is bought chiefly in the United States.

Mercury (cinnabar) must be wholly imported from the United States and Spain.

Tin is not produced in France, although she is a large consumer.

Antimony deposits exist in portions of France and, together with those in Algeria and Indo-China, suffice for all needs.

Arsenic is produced in ample quantity.

Timber production must be added to by large imports.

3. INDUSTRIAL EQUIPMENT (AND FOREIGN TRADE)

The industrial capacity was disastrously affected during the war by invasion and devastation, France being deprived in that period of 10 Provinces in which industrial plants were most numerous, important mines, and fields intensely cultivated. A net result of the war was a loss of about 800,000 people, almost wholly workers.

Subsequent rehabilitation, reconstruction, renewal, and reorganization have brought about an increased, improved, and modernized industrial plant which, in future, will make possible manufacture and production in greater volume and efficiency than before. Labor shortages exist and are only partially made up by employment of foreigners.

The added metallurgical equipment and capacity, together with experience gained in the war in methods for mobilizing industry and swelling production in needed supplies, assure to France in event of war an ability, if raw materials be available, to supply adequately her needs in munitions and war material.

Foreign trade steadily increases and becomes more favorable, the balance, by value, of imports being only slightly in excess of exports.

4. TRANSPORTATION

The railroads, the highways and road net, and the waterways give to France a transportation system suitable for all economic needs and adapted to strategic concentrations and supply of troops wherever the situation requires.

Because of lack of fuel oil the motor vehicles in use are fewer for both commercial and military purposes than otherwise probably would be the case; animal-dran transport is, consequently, depended upon in large measure.

In shipping the war losses have been made up, and floating transport is available in capacity to embark 150,000 men of an expeditionary force. Carrier conection between France and her colonies is inadequate and precarious.

In aviation France has an equipment superior to that of any other nation.

5. COMMUNICATIONS

Submarine cable connections between France and foreign nations exist by lines, either French or foreign, operating under concessions. Direct cables connect with the North African territories.

The uncertain communication by wireless prevailing up to the time of the World War has given way to a system of powerful stations maintaining contact with the most distant countries and the outlying colonies. A shorter-range system enables contact to be continuous in case of interference with ordinary telegraph circuits by snowfalls or other causes and assures uninterrupted communication between the mainland and the principal islands along the coast.

Supplementing the powerful Government installations, France has been developing commercial wireless activities through private enterprise and to-day probably has the largest, most efficient, and most powerful wireless equipment in Europe.

Radio operation, including that in Algeria and the colonies, is a monopoly of the state; in time of war it at once comes under control of the Ministries of War and Navy.

Telegraph systems, as well as telephone and postal, are in a department of the Government under control of an Assistant Secretary of State.

Trunk lines connect Paris central office with all chief offices of the department, also with sous-prefectures in the case of important towns. Branch lines connect the chief offices of departments with all sous-prefectures, and the latter are connected with the chief offices of the lesser subdivisions. The direction of the main trunk lines is that of the main trunk railway lines in every case.

6. FINANCE

The general budget provides for revenues of 23,437,954,832 francs and expenditures of 23,402,487,556 francs, thus allowing for a surplus of 35,467,276 francs. The item of interest on reconstruction loans was incorporated in the general budget.

The special budget of expenditures recoverable under the treaty of peace carries expenditures of 13,582,000,000 francs, such sum being largely devoted to rebuilding the devastated areas, the payment of pensions, and expenses of the army of occupation.

The budget, giving revenue and expenditure at about 23,000,000,000 francs each, is only a part of the entire income and outgo of French public moneys. There exists in addition unforeseen expenditures in the provisional monthly credits, the special budget of recoverable expenditures, and the accounts of the railway, post, and telegraph systems and other semigovernmental yearly balance sheets, which

must be considered in any complete review of French state finance. The total expenditures for which the Government is responsible have aggregated about 50,000,000,000 francs annually for the past few years, while the revenues from taxation are limited to the general budget only, and have averaged about 20,000,000,000 francs, leaving a mean annual deficit of 30,000,000,000 francs, which has been met by borrowing. All kinds of Government obligations have been utilized, ranging from advances by the Bank of France to long-term bond issues. The most significant item is comprised in the national-defense bonds, which run only for a few months and have risen to the enormous total of more than 115,000,000,000 francs.

The total French public debt stands approximately at 430,000,000,000 francs.

The total amount owed France by other countries equals 53,000,000,000 francs.

Interest is not being paid on her foreign debt to the United States and Great Britain. Interest on her domestic debt of 306,000,000,000 francs takes over half her total revenues. Interest on the foreign debt would bring the service of her debt to more than two-thirds of annual receipts. Expenditures on national defense included in the general budget, the special budget, and in some of the annex budgets amounted to over 31 per cent of revenues in 1922. Unproductive expenditures is thus seen almost to equal the entire receipts from taxation.

The national debt, being compounded annually, grows and becomes increasingly burdensome.

The foreign debt of 124,000,000,000 francs is offset by French credits extended Russia, Belgium, and other European states amounting to 53,000,000,000 francs. The French share of German reparations, amounting to about 104,000,000,000 francs, brings total French claims against foreign countries to 157,000,000,000 francs.

The domestic debt of 306,000,000,000 francs is held by French nationalists and, being purely an internal transaction, is subject to the taxation policy of the Government and does not really affect French solvency toward the outside world.

The service of the enormous and increasing domestic debt (omitting any consideration of the vast sums due abroad) absorbs an abnormal share of the state revenues. The situation has passed a stage where it can be met by any ordinary financial methods. A very drastic scheme of taxation, supplemented by economy in spending, seems imperative to assure stabilization of the franc and to bring about a balance between revenues and expenditures and whereby further borrowing may end.

7. MAN POWER

French population, including that of Alsace-Lorraine, on March 6, 1921, was 39,207,666; this number is inferior by nearly 400,000 to that of France in 1911. Post-war France shows a decrease of 2,104,975 inhabitants, due chiefly to war losses and consequent decline in birth rate. The foreign element represents 3.9 per cent of the population, or about 1,550,460, of whom about 133,000 are in Alsace-Lorraine.

In France proper the total man power of suitable age for military purposes is 5,172,000. In an emergency demanding greater numbers than her white population can provide, it is expected France will utilize great numbers of her colonials not alone in fighting forces but also to labor in pursuits of industry and agriculture.

Emigration is negligible.

There has been a slight but steady movement of people from rural areas to more populated centers. The percentage of population described as rural is shown over a period of years to be: 1872, 68.9; 1891, 62.6; 1911, 55.8; 1921, 53.6.

The birth rate continues low. The years 1920 and 1921 showed gratifying increases over the years just before the war; but the first half of 1922 indicated a decrease. Females exceeded males in 1911 by 683,245, and in consequence of the war this excess is now estimated at about 2,000,000.

Employment situation has steadily improved since 1922. Unemployment does not exist, and some labor shortage is felt in industries and in agriculture.

Cost of living is threefold greater than in 1914.

Wages have kept pace with increased living costs and have more than trebled in all activities, including agriculture. The 8-hour day and the 48-hour week are accepted as legal standards.

The condition of workers as a phase of the economic situation, with full employment and adequate compensation, tends to contentment and an absence of social unrest.

Half the people being directly interested in the land and homesteads of the country is a source of political and social security. The sheer mass of French peasantry will block all efforts at radicalism.

8. ECONOMIC PENETRATION OF FOREIGN INTERESTS

Control in France by foreign interests of industrial and financial concerns does not exist to an extent sufficient to be an influence in her economic and political policies.

That portion of her national debt owed to Great Britain and the United States may, in the future, in the probable necessity of the funding of those debts, have a bearing upon her financial situ-

ation at home and develop questions in her foreign relations with the two countries interested which will require adjustment.

9. PRINCIPAL ECONOMIC INTERESTS OF NATIONALS IN FOREIGN COUNTRIES (ECONOMIC PENETRATION OF FOREIGN COUNTRIES)

The economic penetration of foreign countries by French nationals is negligible. Emmigration from France has never been appreciable nor in sufficient numbers to any one foreign country whereby their presence or activities has been felt as an economic or political influence.

France is a creditor nation to some of the European and Near East countries and money of many of her nationals is tied up in the obligations of Russia under the Czarist régime; there has been relatively little venture along purely economic undertakings into foreign countries.

10. BEARING OF ECONOMIC SITUATION ON INTERNATIONAL POLITICAL SITUATION

The World War caused France an ependitnre of energies and resources that brought a crop of after-war troubles of the gravest import. More than half of her 1,400,000 soldiers killed came from the farms and almost all of them were young men whose death resulted in a heavy capital loss to the state. There were devastation and destruction in large part of forests, homes, cattle, fields, industrial plants, mines, shipping, and railroads; displacement and impoverishment of much of her popnlation and the derangement of the industrial system had resulted; a vast debt had been incurred and enormous further financial outlay in replacement and rehabilitation was imperative and unavoidable.

Reparation receipts, nnder treaty stipnlations, were expected to solve many of the economic problems.

The distressing realization of German evasion of reparation payments and the failure of an allied defense compact against feared future German military aggression have dictated a French course to maintain her own security and to cause in Germany a willingness to abide by treaty obligations. The manifestation of that course is seen in the size and character of her armed forces, in her attitnde in armament limitation conferences, in her alliances, and in her occnpation of German territory.

Knowing, for the present, she can overcome a military move against her, she also believes that the recent apparent disposition of Germany again to recognize reparation liability is solely due to French action in the Ruhr.

Despite some opposition at home to the Government's course, and in face of the expressed dissatisfaction by some of her former allies, France steadfastly maintains her attitude; its modification or relinquishment can not be foreseen unless she be assured economic and security equivalents of what her political course had for its purpose.

11. GENERAL CONCLUSIONS AND CURRENT SITUATION

Unfavorable factors in the French situation have been the obstacles in collection of reparations, the mounting costs in service of the domestic debt, continued expenditure in rehabilitation, the realization of the unfunded foreign debt, difficulty in balancing the budget, excess of imports over exports, uncertainty in adjustment of irritating differences in foreign relations, and depreciation in exchange value of the franc.

On the other hand, the country is prosperous commercially and industrially and unemployment does not exist. The regained Alsace-Lorraine brought new and large resources in raw materials and agricultural land, in ores, coal, potash, and some oil, as well as great and highly developed metallurgical, engineering and textile industries. Within her old territory she has acquired new forces in the extended utilization of water power, by improvement of ports, waterways, and railways, by increase in shipping, and by the modernization and renewal on a vast scale of her mining and factory capacity and equipment.

Foreign trade has increased and the adverse balance much reduced.

The colonies and regions under French control continue to become sources of supply for practically everything France lacks, except oil; and there are potential reservoirs of wealth awaiting the time when France shall be possessed of moneys for their development.

With added revenue from taxation and retrenchment in expenditure as a prospect, France can not, without favorable adjustment of the political situation on which depends the economic stalemate in connection with Germany, the Ruhr and reparations, bring back and sustain the value of the franc or find relief from her irksome financial burden.

Failing an amicable settlement in her foreign relations and if, by insistence upon her policy relating to Germany, or from other cause, France be engaged in war, she is at present sufficiently powerful to take the initiative, to gain the earlier advantage and, at least for some indefinite time, secure her home territory from invasion. With slight privation she is practically self-contained as to food; her capacity to manufacture munitions and matériel is adequate

for her own requirements and, in considerable measure, for allies; she has many of the needed raw materials, but must be assured of open sea routes for importation of cotton and fuel oil to engage in hostilities of long duration; and in a war of great magnitude she must preserve her communications with North Africa, to supplement her supplies and man power.

FRANCE

INSTRUCTION OF OFFICER PERSONNEL OF THE NAVY

May, 1924

The following somewhat abbreviated translation of an article appearing in the press is of interest as giving an intimate view of how little opportunity is offered French officers for practical experience and training under present-day conditions. It makes mention of the effort now in hand by the war college to make up for this deficiency by lectures by the war college staff to officer personnel in the large naval centers at Toulon, and expresses the hope of seeing this extended to other centers.

Actual conditions under which the navy is now working render details of officers to ships in actual commission very difficult. The number of ships in full commission is not sufficient to enable the officer personnel to keep contact with the practical duties of navigating, tactics, target practice, signals, etc. This situation promises to continue for some time, due to the urgent need for economy now existing in France.

Instruction of officers of all grades, therefore, becomes a question of great importance if we wish to keep the officer personnel up to the high standard of efficiency essential in time of war.

Prior to the war the question of officers and men did not present itself in its present light. The quota of officers and men was practically always filled. Ships were generally in commission where all hands received proper instruction. At the present time the majority of ships are in reserve at navy yards.

The majority of officers now assigned to shore duty are performing duties which, in time of war, are assigned to officers of the reserve.

These officers must have sea experience to be able to take immediate hold of their duties at sea in the event of hostilities.

The instruction of the officer personnel is, therefore, something new which the general staff must take under consideration.

A recent general order has created "conferences d'information" which will be conducted by officers from the "division des ecoles." This is only a feeble step in the right direction—it must be continued.

These conferences should take place at all naval stations where naval personnel is stationed. It would be impossible to order personnel to the headquarters at Toulon to attend these conferences. However, the lecturers could easily be ordered to the various naval stations.

But these conferences are not in themselves sufficient. The best of theories, without practice, are of little use. Officers should be embarked for a few weeks

of training on board ships to put their theory into practice. The profession of a mariner is only learned at sea.

The question of economy does not enter the above scheme, as sea pay and shore pay are practically equal.

The army general staff has for some time been deeply occupied with the instruction of the officers' corps. With the ever-increasing and complicated arms and the necessity for liaison between the different units, the army was compelled to establish a special school for instruction in the use of firearms. It is a similar organization that the navy is forced to inaugurate.

Our special courses already fill a great need, but the graduates of these schools have not the time nor the means to know what is taking place around them. The conferences fill in the gap by permitting each officer to have access to the ensemble of the various schools and courses. This procedure is highly essential if we wish to combat "specialization."

These conferences should be open to all the different corps—engineering, medical, naval construction, etc. This would be an excellent manner to create unity of thought, something indispensable in a military organization.

Hence an exchange of views will result—the command exposing their special needs and their methods; the technical corps explaining the possibilities of the moment.

We often hear comment on the anarchy of ideas prevailing in the naval service. This community of ideas is the best remedy for such a state of affairs.

FRANCE

MILITARY REGULATIONS REGARDING MARRIAGE

May, 1924

In a country more democratic than republican America, and where all possible encouragement is offered to increase the birth rate, it is of interest to quote this army circular:

Marriage of officers and of student officers is authorized under the following conditions:

1. Officers of all corps desiring to contract marriage should make official application through proper official channels to the commanding general of the region.

2. Commanding generals of regions are authorized, by direction of the Minister of War, to approve applications for officers under their command up to the grade of colonel. Requests from officers above the rank of colonel will be forwarded to the Secretary of War.

3. Any application for marriage which does not meet with the approval of the commanding general, for any reason whatsoever, shall be forwarded to the Secretary of War, together with an exposé of the reasons for withholding approval.

4. All applications for marriage with persons other than of French nationality shall be transmitted for action of the Secretary of War.

5. Applications for marriage shall be accompanied by a certificate setting forth the social status of the fiancée, her general reputation, as well as that of her family.

6. This certificate shall be obtained from the mayor of the town and must have the indorsement of the sous-prefet of the district.

7. The commanding general of the region in transmitting the request will give his opinion as to the character of the fiancée, as well as to the merits of the proposed marriage.

8. In this connection he should obtain through the local military authorities wherein the fiancée resides similar information as required by the civil authorities in connection with civil marriages.

9. With a view of obtaining complete information, military authorities can employ the medium of the gendarmerie (federal police). In such an undertaking the military authorities will communicate with the gendarmerie of the district wherein the fiancée resides, who will in turn make the necessary inquiries with full reserve and discretion. The report of the inquiry or any information obtained for the military authorities charged with rendering a decision on the merits of the case shall be strictly confidential.

10. When the fiancée is in the employment of the Government (civil service, etc.) the certificate as to her moral character can be replaced by a certificate of her official record, signed by the head of her department and countersigned by the sous-prefet of the district, to the effect that the fiancée is a Government employee in good standing and not pending discharge for any reason whatsoever.

11. During the month in which the marriage is to take place the Minister of War will be furnished with a marriage certificate (model annexed to circular of July 3, 1840).

12. Permits to contract marriage will be valuable for six months from date of issue. All extensions of permits, changes, etc., shall comply with the above instructions.

FRANCE

VISIT TO TOULON ARSENAL

May, 1924

A general tour of inspection indicated that much work is being done toward preparing Toulon Harbor as a primary naval base. Facilities are being modernized and greatly expanded. Of particular note were the two large dry docks being constructed in this harbor. One is completed and the other about 70 per cent completed. These docks are 420 meters long, are open at both ends; each dock can be used in its entirety or divided into two sections of either equal length or one section longer than the other, depending on the size of the ships to be docked.

The underground magazines are almost completed. These magazines are built in a hill of solid rock and are protected overhead by from 60 to 150 feet of this formation. The nine magazines are well separated, all opening into a semicircular roadway which has been cut down to the level of the magazine floors. Each magazine is approximately 120 feet long, 40 feet wide, and 21 feet high. The roof is of arched concrete 3 feet thick. It is partially supported by concrete pillars, which carry in addition traveling overhead cranes. A space between these pillars is filled by white-brick construction.

The roofs have a cushion of sand about 3 feet thick between them and the rock overhead. Around the magazines is an open space approximately 4 feet wide which is covered by the same concrete roof which butts against the natural rock of the hill, thus receiving its main support. This space is used for the electric wiring, but its main purpose is to maintain the magazines in a dry state and at an even temperature. The temperature is found to vary only from 15 to 17° C.

There were a good many ships of the fleet in the harbor, some for repairs, the others based there for maneuvers. Several submarines, mostly old types, were in dry dock. No visit was made to the shops proper, but it was understood that repair facilities are being brought up to date.

The arsenal has headquarters for the Centre d'Etudes of Toulon where a number of commissions of officers from the fleet study coast defense, communications, fire control, optics, and other technical subjects.

The chief of naval artillery was asked about antiaircraft fire control, but stated that the navy was spending no money toward development in this line, and that the matter was being studied while they were depending on the army technical service for the development of an adequate system.

The optical department stated that they considered the coincident form of range finder preferable to the stereoscopic type inasmuch as operators for the latter type are difficult to train. They are, however, working with both types.

The chief of the technical section displayed curves indicating soundings taken of Toulon Harbor by the sonic depth finder patented by Professor Langevin. This apparatus was discussed at some length, but a request to see a plan of the transmitter used was denied, it being explained that inasmuch as the same transmitter was used for the detection of vessels the drawing was considered confidential.

As the party was passing in a boat astern of the battleship *Paris*, the officer who was detailed as accompanying officer was asked if the *Paris* had increased the elevation of her guns. He replied, "Yes; the *Paris* and the other battleships," but later added "that he thought so." From his first answer there appeared to be no doubt in his mind that these guns had been elevated.

In a conversation with the inventor of a track tracer and of a log for measuring the speed of vessels by the travel of a bubble of air in a tube alongside the ship, he stated that it was expected that this log would give excellent results at high as well as at low speeds. He further stated that they were considering the construction of a log which would give speed over the ground. He stated that the principle involved was that of a pendulum which through its momentum

or inertia registered all variations of speed and direction. This record integrated gives the actual velocity over the ground and the direction. He stated that this is easily possible for a nonoscillating moving body such as a train, but that aboard ship there are great difficulties to be encountered. He gave the impression that he considered these difficulties at present insurmountable.

ITALY

NOTES ON SITUATION WITH RESPECT TO NAVAL-DEFENSE MINES

April, 1924

Mines.—Approximately 20,000 all types. Old Italian type (200 pounds) fitted with pistol firing gear; spherical; no horns. Also British Elia, French, German, and Austrian types.

Mine layers.—Some five or six mine layers; all old and small, adapted for new rôle by conversion. Four small and low speed vessels are being constructed, each to carry 200 mines. All modern light cruisers are fitted as mine layers; 100 to 200 mines. Flotilla leaders carry from 20 to 100 mines. About 50 per cent of modern destroyers are mine layers carrying usually about 10 mines each.

Stocks and deposits.—About 20,000 mines of all types. This total to be maintained. It is believed that the greater part is at S. Bartolomeo, Spezia.

Mining schools and experimental establishments.—No details available.

Mining policy.—The ministry has definitely adopted the Vickers British Elia. It is understood that this is a 5-horned spherical, with 350 pounds T. N. T., and that its details are well known. To eventually supersede all existing types. As this decision would involve the wholesale scrapping of the greater part of the existing stock of mines, which the present financial position of Italy will not allow, the process of substitution will probably take an indefinite time. The permanent stock has been fixed at 20,000, as at present. It is proposed to gradually convert all existing mines to the standard 5-horn type of firing gear and the mine-laying runners to the standard gauge. Sinkers will also be standardized, the type adopted for all the above being that fitted in the British Elia. One thousand British Elia mines have recently been ordered from Vickers as "replacements" for the older mines now in stock. It is proposed to purchase Italy's requirements abroad, as it is not considered economically worth while to set up factories and train personnel here. It is considered cheaper to purchase from Vickers. The sinker used with the British Elia is believed to be that usually fitted to this type and to present no new features.

The mooring rope enables the mine to be laid in depth to about 150 fathoms. It is understood, however, that no practical difficulty is anticipated in laying mines up to almost any depth should circumstances demand it.

Practice.—No details available.

Antimining.—H. S. M. S.: Excepting some half dozen old destroyers too slow and small to be of value, all flotilla leaders are or will be fitted as mine sweepers or mine layers. The proportion is approximately 50 per cent to each. The former carry the H. S. M. S., the latter from 10 to 30 mines each.

H. S. s/m S.: Is also used in Italian Navy. It is understood that a new form towed from forward and greatly improved will eventually supersede the H. S. s m S. now in use. The advantages claimed are: (1) Can be towed up to 30 knots or more; (2) cheaper and simpler form of depth keeping has been substituted for mercury; (3) in addition to usual means of firing, when wire is grazed by a s/m the sweep rises and makes contact before exploding; (4) when towing astern, sweep automatically traverses wide area in a horizontal plane, thus sweeping more effectively.

P. V.'s: All war vessels down to and including flotilla leaders are fitted with P. V.'s. A large stock remains from the war, and no further P. V.'s have been manufactured nor improved in past six years. They are not exercised, being regarded as rather a nuisance. Chains are frequently left unrigged and no strict rules appear to be followed in their regard.

ITALY

TORPEDO SITUATION

April, 1924

TORPEDO WORKS, FIUME; TORPEDO SITUATION IN ITALY

A new company at Fiume has recently been formed and the factory reopened January 24, 1924, under an "All Italian" management. Sig. Orlando, the president, is brother of the head of the Orlando Shipbuilding Co. at Leghorn.

The reopening of the Whitehead Works has been backed by the Banca Nazionale di Credito (late Banco di Sconto) the chief rival of the "Banca Commerciale," supporters of the "Silurificio Italiano," Naples. Sig. Carlo Hassenteufel, who was with the late firm for over 37 years, is technical director in the new company.

The machinery, which was transferred to a safer locality in Austria during the war, has not yet all been replaced, but the majority of the excellent equipment appears in good order. As there

seems little prospect of the manufacture ever again reaching its pre-war proportions, they will gradually sell off a certain number of surplus machines. It is also proposed to undertake building air compressors and other kindred machinery. The construction of torpedoes alone will no longer serve to maintain the works on a sound economic footing.

Prior to the war some 1,200 hands were employed, and two torpedoes a day could then be manufactured. Work now has been recommenced on a small scale, with only 200 men, 85 per cent skilled hands and ex-employees of the original firm.

It is understood that a large proportion of the remaining employees are still resident in Fiume; and as many of them have now been compelled to take Italian nationality, no difficulty in augmenting the present personnel is anticipated, when necessary.

The whole establishment is conveniently arranged, and the work is going on in a businesslike manner in spite of the factory having lain idle for many years. There can be little doubt that by comparison with its ambitious and self-confident, though amateurish and inexperienced rival at Naples, the long standing of the Whitehead firm at Fiume and the unrivaled experience of its highly trained staff places it at an enormous initial advantage.

The firing range is adapted for 2,000 to 6,000 meters, but by a slight alteration to seaward of the angle of fire a range of 15,000 meters can easily be obtained. Torpedoes can be fired from an above-water or submerged tube, as required. The old pontoon and hand flag recording systems are still used.

SUMMARY OF RECENT PROGRESS IN TORPEDO DESIGN AT FIUME

(*a*) Toward the close of the war a new design of engine was produced which both in form and principle constituted a radical departure from the old brotherhood four-cylinder radical type. This machine was a horizontal, double-acting, two-cylinder, reciprocating engine with connecting rods and circular slide valves; in principle and action closely resembling a marine steam engine.

The engine was so placed that its crank shaft revolved parallel to the shorter axis of the torpedo, motion being transmitted to the propeller shafts through quadruple bevel gearing of the usual form and situated at the inner ends of the propeller shafts.

(*b*) The heater was of the standard Whitehead "wet" pattern.

(*c*) Only a few 18-inch torpedoes of this design were actually delivered for the Austrian Navy before the close of the war, and it is doubtful if any such ever saw service.

By comparison with the old Brotherhood four-cylinder engine, these gave excellent results, but considerable trouble was experienced

owing to the employment of stuffing boxes on the propeller shafts which it was found impossible to maintain water-tight, causing a loss of efficiency in transmission of approximately 5 per cent.

(*d*) A later design on the same general lines, but embodying several marked improvements on its predecessor, was then gotten out. Manufacture was interrupted by termination of hostilities.

In 1922–23, when Whitehead's was declared bankrupt and when the consequent liquidation proceedings were in progress, complete drawings and a single 18-inch model were in existence at the works.

It appears, however, that a Mr. Stewart, Messrs. Vickers's representative for the liquidation, succeeded in removing this model torpedo, together with all finished drawings, to Weymouth.

This latter factory could thus manufacture this new design. Vickers then secured the services of Mr. Jones, for some 30 years associated with Whitehead's, and who latterly occupied the position of local manager.

(*e*) Though placed by Mr. Stewart's action at a disadvantage, the Fiume company found it possible to reconstruct the same design from some rough drawings overlooked by Mr. Stewart, and a second 18-inch model has been successfully produced.

Some 50 runs were made by this torpedo recently, watched by experts from the Italian Navy, who are understood to have been satisfied with the results attained.

(*f*) A 21-inch (533-millimeter) torpedo of the same design is now being constructed and should be ready for trial about June, 1924.

(*g*) A conditional guaranty seems to have been given to the firm by the Italian Government, but if, as is anticipated, the trials of this new torpedo prove satisfactory, the company base their future hopes mainly on foreign governments, to whose patronage in the past so much of the prosperity of Whitehead's Fiume works was due.

Spain in particular is at present being courted, since it is believed that the Spanish Ministry of Marine are still contemplating the placing of a large order with one or the other of the three firms at Weymouth, Naples, or Fiume. Apparently with this object in view, a Spanish technical commission was recently sent to the latter place to investigate, but owing to the then disturbed state and uncertain future of Fiume no decision was come to. It is understood that Spain would not place orders with the S. Tropez works, as they are averse to obtaining French torpedoes.

DETAILS OF THE NEW 18-INCH (450-MILLIMETER) FIUME TORPEDO

Head.—170 kilos (375 pounds) T. N. T.

Air pressure.—175 atmospheres (2,625 pounds) per square inch.

Air vessel.—Material and rough forgings are at present obtained from Witkowits in Czechoslovakia, but it is hoped that the steel works at Terni will soon manufacture these.

Consumption.—About 11 kilos (24.2 pounds) per horsepower per hour.

Depth keeping.—Weight and hydrostatic valve of the usual type. The weight is locked for the first few hundred yards of the run and is fitted with "sudden-release gear."

Heater.—Whitehead "wet heater"; minor modifications and improvements. Single automatic-firing pistol, two-cartridged. Externally the heater appears almost identical to the British type.

Speed and range.—2,180 yards (2,000 meters), 45 knots; 3,270 yards (3,000 meters), 40 knots; 6,540 yards (6,000 meters), 30 knots; 8,720 yards (8,000 meters), 25 knots extreme range.

Engine and transmission.—Single, horizontal, two-cylinder, double-acting, reciprocating engine, Whitehead type, fitted with connecting rods and circular slide valves; 180 horsepower; stroke, 120 millimeters; bore, 100 millimeters. No metallic or other packing on piston or slide rods. Crank shaft arranged transversely in the torpedo transmission by quadruple bevel gearing of ordinary type and fitted at inner ends of propeller shaft. All other bearings of ordinary white-metal type. Propeller shafts are entirely inclosed in fixed tubular cover or sleeve which maintains the water-tightness of the engine room and afterbody. The engine also is practically a "closed one." Forced lubrication. Stuffing boxes at the inner and outer ends of the propeller shafting have been dispensed with, with a resultant gain in efficiency of the transmission of approximately 5 per cent.

NOTE.—The main improvements claimed for this torpedo over the original similar design (see (*a*) to (*e*) above) lie in the inclosed engine and propeller shafts and in the abolition of the stuffing boxes.

DETAILS OF THE NEW 21-INCH (533-MILLIMETER) FIUME TORPEDO

Head.—250 kilos (552 pounds) T. N. T.

Speed and range.—3,270 yards (3,000 meters), 47 knots; 16,350 yards (15,000 meters), 26–27 knots extreme range.

NOTES.—Other details as for the same design of 18-inch Fiume torpedo. The 21-inch torpedo is now in course of construction and should be ready for trials about June, 1924.

Torpedo tube arrangements.—The "Silurificio Italiano," at Naples, have designed an ingenious arrangment for their new 18-inch and 21-inch torpedoes and tubes which enables range, depth, and gyro angle to be set or altered with the tube loaded; i. e., without launching back or opening the rear door. This mechanism is operated by three small handwheels at the rear of the tube, the necessary "dials"

for setting being conveniently placed alongside their respective operating wheels.

Though such an arrangement has not been previously tried at Fiume, it is understood that it is now proposed to adopt similar contrivances.

REMARKS ON ITALY'S TORPEDO POLICY

[From a reliable source and believed to be approximately accurate.]

(1) The annexation of Fiume has produced complex and conflicting issues which have made it difficult to determine on a satisfactory torpedo policy.

(2) With the object of so doing, however, a conference was recently assembled in Rome at which Sig. Mussolini, the Minister of Marine, and his excellency the Governor of Fiume were present.

(3) Amongst the questions discussed at this conference were those relating to the future status of the torpedo works at Naples and Fiume and the degree of the Government support, if any, which should be accorded to each.

(4) The Minister of Marine is believed to have been against the bolstering up of Fiume works, on account of the unsuitable strategetic position of Fiume and the undesirability now of supporting two private torpedo establishments in Italy.

(5) The remaining members, however, took a different view. Holding that, as a broad principle, it was desirable to encourage competition, and that as reasons of local policy rendered it important to resuscitate the whitehead factory, the former object would be obtained by so doing. Also that by granting some degree of Government assistance to Fiume it would help reestablish that confidence in the firm's productions which was an obvious necessity, preliminary to the revival of foreign patronage.

(6) In accordance, therefore, with the opinions expressed by the majority of the conference it was decided to encourage the development of both factories by a proportional annual subsidy or minimum financial guaranty, "orders" being placed with both firms, conditional on the trials with the experimental torpedoes now under construction proving satisfactory.

(7) For strategic reasons Naples works are to be regarded as the principal national factory, obtaining the larger share of Government patronage and financial support.

Fiume, whilst obtaining a smaller measure of assistance, is expected to rely mainly on a resumption of its pre-war form of activity and looked upon by Italian Navy as an alternative source of production and inducing competition.

8. It is understood that the Government will place orders with Naples and Fiume roughly in the proportion of 2 : 1. Naples has

already secured a conditional contract for 100 21-inch torpedoes and it is presumed that Fiume will now be given an order on similar terms for 50.

9. It is understood that the annual subsidies will be 45,000,000 lire to Naples and 15,000,000 lire to Fiume. As such sums appear very large, it is thought that they more probably represent a guaranteed minimum annual "order," or its financial equivalent, rather than subsidies in the ordinarily accepted sense.

10. The Naples torpedo, partly by reason of its engine and heater and partly owing to local conditions, is said to be considerably more expensive than the Fiume torpedo. This probably accounts for the otherwise disproportionate "guaranties."

11. The deductions seem, firstly, to be built up on the belief that Italian torpedo factories will regain a large proportion of foreign patronage, an assumption in itself sufficiently problematical.

Having decided this, the Italian Government appears to suppose that such patronage will be content to be directed into the channels of production most convenient to Italy, without any reference to the relative merits of the several torpedo firm's designs.

12. On the relative merits of the two firms no opinion of any real value can be expressed. There are doubtless good points in each, though in consideration of the high speed and horsepower required in the modern torpedo, the principle adopted for the engine and drive in the Naples design would appear to represent a distinct advantage. Moreover the speed of the Naples torpedo also appears to be somewhat higher than that of Fiume, whilst the design of the engine and the material (chrome-nickel-steel) used in its construction are believed to give it an endurance considerably greater than anything previously attained in torpedo construction.

ARGENTINA

GENERAL NAVAL SITUATION AT PRESENT

April, 1924

The Argentine Navy, or more properly the effective portion of the Argentine Navy worth considering by an ally or by an enemy, consists of the following:

2 dreadnoughts (to be changed to oil burners; 22.5 knots speed; twelve 12-inch guns).
4 destroyers (950 tons, to be changed to oil burners; 34 knots).
5 cargo transports (12 to 14 knots).
1 oil tanker (2,600 tons; 10.5 knots).
10 mine planters and sweepers (500 tons; 15 knots).

To these may be added, for incidental use:

4 old armored cruisers, of about the same date and general merit as our *Olympia*; speed, 20 knots.
2 old cruisers of about the same date and general merit as our *Baltimore;* speed, 20 knots.
3 small coal-burning destroyers (340 tons; 26 knots).
10 small cargo transports (9 to 11 knots).

The remainder of the Navy, of no military value, but for training and patrol work, consists of:

2 old coast-defense vessels (14 knots; two 9.4 guns).
2 river gunboats (15 knots; two 6-inch guns).
2 monitors (7 knots; two 8-inch guns).
1 gunboat (20 knots; two 5-inch guns; 3 tubes).
2 training ships.
6 small and antiquated torpedo boats, of about the age and class of our old *Cushing.*
15 tugs, of which 9 are under 100 tons displacement and are for use only at dockyards or in still water.
10 various craft, such as surveying ships, lighthouse tenders, all under 1,000 tons displacement.

Meager appropriations, together with the lack of homogeneity of the units and the large number of conscripts to be trained yearly, has in general, tended to restrict the Navy's efforts to a repeating cycle of elementary training. Conscripts enter in January for a two-year course, so that each year some 3,000 conscripts out of a total force of 11,000 leave the service. It can be seen, then, that all ships are held rather closely to the training of these men. The navy also mans and operates the naval transport service (cargo carrying), the lighthouse service, and the extensive prefectura maritima, which take a goodly portion of the officers and men away from strictly military duties. The elementary training is well done. Particularly well done is the course at the naval machinists' school, from which comes all of the engineering talent for the regular navy. The appearance of the enlisted men, afloat and ashore, is excellent, and the ships are clean and well kept up.

The line of the navy consists of naval academy graduates with a relatively small percentage of mustangs, who entered prior to the establishing (or, rather, permanent establishing) of the naval academy. The line is thereby not homogeneous so far as standardization of doctrine and esprit are concerned. The naval academy is now the sole source of entry for officers, and the entire navy is convinced of the necessity of this restriction.

The Argentine naval officer is active, hard working, intelligent, and well informed. They administer and navigate their ships well, and carry on a well-disciplined, proud, and contented organization. They serve less time at sea, but devote more to study and instruction

than do we. Their courses of study for enlisted men are longer and more painstaking and exact than ours, with the result that their men are better drilled and more competent. The high rate of pay for enlisted men of the regular establishment, together with simple and orderly programs of exercises faithfully carried out and the regularity and fairness of promotions, make their enlisted force efficient and contented. Nevertheless, increase of pay for petty officers has now become necessary on account of the demand for ex-navy men.

So far as proficiency in tactics is concerned, the Argentine officer has had practically no experience except in ships acting singly.

Promotion by selection was very hard hit by the political interference of the late government (radical), the President having practiced the old Jacksonian doctrine of "To the victor belong the spoils," and having promoted and favored those officers who took a hand in the revolution of 1890.

At present, 1924, selection boards are functioning according to law, and there is little cause for complaint.

Most of the fighting ships of the Argentine Navy remain in the naval bases on account of lack of funds for fuel, maneuvers, etc. However, one division, called the Second Naval Division (the training division), generally composed of two or three old armored cruisers, carries out a training program each year. At the end of the training period, generally in November, simple tactical maneuvers, target practices, etc., are held.

At the same time some of the destroyers join the division for smoke-screen exercises and possibly a simple search and attack problem. The Argentine Navy can not carry out any extensive program until more money is available.

The following program for the training division for the year 1924 has been published:

The division will consist of the armored cruisers *San Martin* and *Belgrano* and the cruiser *Buenos Aires*. The base will be Puerto Belgrano.

Division will remain at base until the middle of April, holding boat drills, infantry drills, small-arms firing, and general preliminary instruction.

About the middle of April division will sail for Golfo Nuevo, where they will stay about 40 days, carrying out the usual instruction drills, etc.

At the end of May division will return to Puerto Belgrano, holding drills, maneuvers, etc., en route. After a short period for refueling, etc., division will put to sea for about one month for exercises. Single ships will visit some of the southern ports during this period.

Early in August division will return to Puerto Belgrano for refueling, etc., and then will put to sea for another period of training.

During October the final training for the target practices will be completed and during November the annual target practices and inspections will take place.

ARGENTINA

NAVAL ACADEMY REQUIREMENTS

May, 1924

DESCRIPTION—GENERAL RULES

The naval school is for the purpose of preparing Argentine youths for naval officers of the line and of the engineer corps.

The candidate who successfully passes the entrance examination is admitted as a cadet (aspirante), which title he holds during the course of studies, and subject as such to the Military Code, to the regulations of the school, and to the manual which he reviews when he enters: in general to all the orders that the Government sees fit to issue.

All citizens entering the school make a formal contract to serve in the navy for six years after graduation. Cadets discharged for any reason will be given credit for time served in computing their compulsory military service. If the Government should for any reason see fit to extend the school course or to alter the rank to which cadets are promoted upon graduation, the students are bound to accede without right of claim. All requests by parents or guardians must be forwarded direct to the director of the school.

In no case may students expelled for bad conduct reenter the school.

With the exception of the preparatory course for the line, all the cadets of the naval school will be given scholarships, and the number of scholarships for the line and for the engineer corps shall be fixed annually by the budget law.

Annexed to the courses of the line, there shall function a preparatory course with cadets who are boarders, who, as well as those who have scholarships, will be subject to the rules and regulations issued. The number of boarder cadets will be determined annually by the Ministry of Marine.

To this course sons of officers of the navy and army are admitted, other conditions being the same, preferentially, and pay half the monthly cost. Orphan sons of officers of the navy and army are exempt from payment, provided no more than one per family is admitted.

Admitted candidates showing little aptitude or bad conduct may be discharged by the director.

Entrance examinations shall be taken on the premises of the school the first week in March of every year. The board of the school may in necessary cases name commissions for the preliminary examination of candidates from the Provinces.

Entrance to the naval school may be made only to the preparatory course of the line, as boarding scholars, or with scholarships to the first year for officers of the line, and preparatory course for the engineers corps.

For entrance to the courses indicated in the previous paragraph the following conditions are necessary:

(1) Be a native-born Argentine, or son of a native-born Argentine in the case of being born in foreign lands.

(2) Have honorable antecedents.

(3) Prove to be physically apt to follow the career by means of a previous medical examination to the proofs of competency before a commission of surgeons named by the Minister of Marine, to which the school's surgeon will be a member.

(4) Be, the 1st of January of the year of entrance, of an age comprised within the limits expressed below:

Course:		Minimum age	Maximum age
Preparatory, line, and engineer corps	years	14	17
First year, line	do	15	18

(5) Have successfully passed the entrance examinations, which will be taken on the premises of the school before a commission formed by chiefs, officers, and civil professors of the institution.

The duration of the studies for both corps, without counting those of the preparatory course, shall be of four school years, with the addition of an application course on board a training ship. During this application course, an instruction voyage shall be made of a duration of from 8 to 10 months.

All the cadets, at the end of each school year, shall have a period of embarkation and practical instruction on ships of the fleet. This embarkation shall last from 1 to 12 months.

Instruction is theoretical-practical and is in scientific and general subjects and in drills.

The faculty is composed of civilian professors and of officers, as per provisions in the budget law. Students receive lessons in gymnastics, fencing, target practice with pistol and rifle, and exercise constantly at infantry drill in open and close orders, at landing party, and at seamanship.

Heretofore the engineer cadets were taken from the best pupils of the mechanics school (naval base, Buenos Aires). In the future they will enter in the same way as the other candidates except that they must start with the preparatory course. The objection to the old scheme was that the engineer cadets were much older than the line cadets.

Also there are a few boys, termed "agregados," who take a preliminary course at the naval school before entering the preparatory course. It is for boys about 13 years of age, and the course is for one

year. This course is supposed to produce better candidates for the preparatory courses. The pupils pay for their tuition and all expenses. This course was inaugurated in 1923.

ARGENTINA

NAVAL POLICY

May, 1924

Argentina has enjoyed peace for many years and has no distinct popular feeling of resentment against any country. Ordinarily there is but little interest evinced in increase of the navy or in any possible employment of naval force. Naval ambitions are confined to the naval officers, who, realizing that large appropriations can not be obtained from Congress, express their hope of seeing the navy a fighting unit, small but well rounded at that, and sufficient to preserve esprit of the naval forces. However, the navy and army have done very well in the last year due to clever handling of the situation.

The Argentines are very proud, very sensitive, very patriotic, very jealous of the other countries of South America, and very much afraid that the rest of the world does not, or will not, recognize their actual or assumed greatness. Having these characteristics, they are very easily influenced by certain kinds of propaganda.

The Argentine naval officers, who as a class are 20 years ahead of the rest of the country, are well aware of this, and when our naval mission was sent to Brazil they saw their opportunity and proceeded to make the most of it. They knew perfectly well what the mission was and what it could and couldn't do. However, they pretended to feel hurt, discriminated against, alarmed, etc.

A great newspaper campaign was started against Brazil and the United States. It was shown how Brazil would be so much more powerful than the other countries in South America, and that this would leave Argentina in a very precarious position with her small navy and army—how the United States was helping Brazil to prepare against Argentina, etc.

Next came the Pan American Congress at Santiago, Chile. In this case Chile and Brazil were represented as combining against Argentina. The papers featured this at great length.

Of course the patriotic Argentines could not stand this, and the money was voted for the modernization of the ships and the purchase of equipment for the army.

If the propaganda could have been carried on longer, or if there had not been so much dissension in Congress between the two

branches of the Radical Party, the naval building program might have been passed.

However, conditions changed and the bill was withdrawn.

The propaganda in the United States and against the United States had also another idea in view. The Argentine Navy is very anxious to send their officers to our Navy for training, as they used to do. They hoped that we might suggest a return to that policy in order to offset the bad effect of our naval mission to Brazil.

The Argentine naval authorities are still working on this question.

The Argentine naval officers in general are a fine type and the most capable people in the country; also most of them are very friendly toward the United States.

The friendship and mutual respect between the two navies, and hence the two nations, can be increased if we allow the Argentine naval officers to serve in our Navy. For that reason it might be worth while to permit them to send officers to the United States Navy for training.

Careful consideration has been given to the subject of wars with Chile and with Brazil; and the plan calls for an immediate attack on the enemy. Blockade, or semiblockade, they say, means obliteration of revenue from crops and herds, and deprivation of coal and iron; hence, loss of the war. Defensive plans seem to have been relegated to minor importance for the above reason; and this may account for the lack of mines for the protection of Buenos Aires and Bahia Blanca, and to the failure to modernize the defensive batteries of Puerto Militar. Nevertheless the presence of submarines in the Chilean Navy has thrown the offensive plan against Chile into confusion; and officers have stated that the Argentine fleet must remain at Puerto Militar and trust to powerful neutrals, like England and the United States, to make Chile very lenient in blockading or in allowing blockade runners.

Capt. Segundo R. Storni, an able officer of the navy, has written a book on "Argentina's Interests at Sea," in which he shows the necessity of having a large merchant marine if Argentina is ambitious to become a first-class power; the geographical and commerce protection features of Argentina, and the necessity of a primary operating base at Samborombon, a secondary base at Deseado, minor bases at Bahia Blanca, Madryn, Gallegos, and Thetis, with defended harbors of refuge at Mar del Plata, Quequen, San Blas, Cape Dos Bahias, Comodoro Rivadavia, and San Julian, together with railway lines permitting quick troop movements and supply support to the bases. The importance of Argentina obtaining the Falkland Islands is also brought out.

In support of an adequate naval force, the following points of friction that might become acute are noted by Argentine officers:

(1) Discontent of Argentina over the settlement of the Chilean boundary, whereby Chile was awarded such portions of Tierra del Fuego and Patagonia as to give her all of the Magellan Straits, with outlets on the Atlantic. (This discontent is not general, it having long since been forgotten.)

(2) Contempt for Brazil and intolerance and lack of consideration of the Argentine people for any policy or action taken by Brazil.

(3) The coming in of extensive oil fields along the Bolivian-Argentine-Paraguay border line, and friction to be expected in their development.

(4) Experience brought home by the recent war, showing that world wars involve all neutrals.

A South American war is a most remote possibility, so far as real cause is concerned. Nevertheless, any insult, real or fancied, to the country would be sufficient to turn the passionately patriotic Argentine nation into a hornet's nest.

ARGENTINA

NEW BUILDING PROGRAM

April, 1924

The Argentine Ministry of Marine has made up a building program to be submitted to Congress when it convenes in May, 1924. This program is secret, but it is rumored that it is as follows:

Six submarines similar to United States *S–40* type.
Six destroyers similar to United States type.
Two light cruisers, *Richmond* type.

The following ships are to be modernized during 1924:

Battleships:
Moreno and *Rivadavia* (in the United States).
Destroyers:
Jujuy (at naval base, Rio de la Plata).
Catamarca (at naval base, Rio de la Plata).
Córdoba (at navel base, Buenos Aires).
La Plata (at naval base, Buenos Aires).

Law No. 11222, which authorizes the modernization of the battleships *Rivadavia* and *Moreno* and the four destroyers of the *Catamarca* class, passed on September 20, 1923, was signed by the President and promulgated same day. This law is translated as follows:

ARTICLE 1. The E. P. is authorized to spend up to the sum of 9,500,000 pesos gold for the performance of the necessary repairs on the battleships *Rivadavia* and *Moreno* and the four destroyers of the *Catamarca* class, in the modernization of their ordnance material, fire control, and torpedoes; to make the necessary changes in their turbines; to adapt both types of ships for the use of

fuel oil only; to acquire for the above-mentioned ships 75 torpedoes, 14 compressors, 500 depth charges, and the necessary apparatus for discharging same, and for the acquisition of 500 defense mines and the corresponding equipment for depositing, laying, and sweeping of same.

ART. 2. The funds, whose expenditure is authorized, will be taken from the general income, being able to make use of the credit, if necessary, and will be placed at the disposal of the Ministry of Marine in eight quarterly quotas, at the time requested by this department.

ART. 3. The expenses arising from the fulfillment of this law will be charged to the same.

AUSTRIA

SPY ORGANIZATION

May, 1924

The following report is a translation of a report made by an Austrian officer, who was at one time Austrian naval attaché in Berlin. According to a confidential statement of his, a European navy department made an offer to him after the war to answer certain questions based on his war experience. On his request, this officer was permitted by the Austrian Navy Department to use the confidential archives as sources. Thus all the questions of interest to the foreign navy department were treated in special chapters which were of great value, due to the fact that most of the material was taken from the original reports of the ministry. These reports were divided into two parts, the first containing all the reports of general interest, while the second group treats war experiences based partly on special circumstances and partly on the special geographic situation.

Subject	Pages	Price paid by foreign government
GROUP I		
(1) Spy Organizations	18	$50
(2) Protection of fleet at anchor	9	50
(3) Method of attack by submarines	8	50
(4) War experiences regarding technical points of shipbuilding	49	80
(5) Mines	25	40
(6) "March" at sea of fleet in war time	11	20
(7) Signs of recognition and their changing	14	60
(This is merely an explanation for the "Manoevrierbuch und Signalbuch," Parts II and III, which were considered confidential. This book was only loaned for a very limited period of time.)		
GROUP II		
(1) Replacing crews and officers on board warships	16	25
(2) Lights and beacons	2	10
(3) Organization of admiralty in war	8	50
(4) Attacks (operations) in the Adriatic Sea	(?)	(?)
(5) Cooperation between ships and airplanes	12	20
(6) Importance of a river fleet in war time	12	25

Spy Organizations

Two distinct methods are recognized in intelligence work, which is also called espionage: (1) Obtaining important data regarding the enemy or foreign states; and (2), with the same end in view, the prevention of such activity at home or rendering it extremely difficult. We therefore speak of offensive or defensive espionage, or in general of espionage or counterespionage.

Those elements who, either through bribary or political motives, engage in espionage against their own country and betray it to the enemy must be differentiated from those who practice espionage in the service and to the good of their own country.

Counterespionage is to prevent treason. Traitors have existed in every country from immemorial times, even when the country has been a consolidated national body. Traitors will also continue to exist in time to come. They belong to the most despicable of classes and one under which the former Austro-Hungarian Empire had to suffer very greatly. The traitors are mostly to be feared because they pretend to be friends, and then at the first favorable opportunity knife one in the back. Therefore when traitors are caught in time of war, they should be treated with no consideration whatsoever in order that their deeds might be branded for all time to come, and they should be subjected to the most ignoble of deaths.

While offensive or defensive espionage is most valuable for the state in question, and its practice not only requires great cleverness but also unusual courage, the traitor in the employ of the enemy always represents a despicable personality even in the eyes of his employers.

It therefore becomes a special task of the admiralty staff, or a corresponding division of the navy department, to organize an extensive intelligence service in time of peace, having branches in all those countries representing potential enemies. The best persons for this purpose are old retired naval officers, in no way prominent personalities in their former posts and modest in appearance, occupation, manner, and outward demeanor. The more modest and inconspicuous their appearance and mode of life, the more valuable their services will be. These pensioned officers (preferably naturalized citizens of the country of residence, and speaking the native tongue) should be located in all the principal cities forming important centers for this kind of work or having general military or political significance. These persons must be sufficiently supplied with money in order to enable them to form a many-branched organization in the territory allotted them, which will be capable of furnishing them with the necessary information desired.

Japan organized an extremely model service of this kind before the war with Russia. Nearly every barber and waiter in those places in Port Arthur, Vladivostok, etc., frequented by Russian officers were Japanese and were in the intelligence service of their country. Many of them were officers. Espionage was celebrated in czaristic Russia. This service was originally intended to protect the throne against nihilists and revolutionaires, but it subsequently served military purposes. Counterespionage in Russia was unparalleled. However, on account of the strict passport and traveling control, it was easy to carry out. Nevertheless only very few spies succeeded in remaining in Russia undiscovered or in attaining their aim. Most of them were caught and put out of the way.

The fact need not be emphasized that in the organization of such an important intelligence service the system itself is not so important as the qualities and characteristics of the persons selected for this very delicate work.

During the last great war espionage centers developed especially in the neutral states, and above all in Zurich, The Hague, Stockholm, and Christiania. A large number of obscure elements congregated in these places, selling reports regarding their own countries. The more trustworthy and correct these reports proved to be, the more the man's prestige increased and the higher went his price.

But there were also many honorable men in these cities who endeavored to secure reports from the enemy's camp without any traitorous act on their own part. These men were always officers, although they did not appear in that capacity and never had any connection whatsoever with the official representatives of their country such as the embassy, legation, or consulate. They always lived in modest private apartments and had to avoid anything that might tend to direct attention to them. Persons of this kind did exceedingly valuable service during the war.

For example, through the activities of an Austrian naval officer residing in Zurich, the Italian dreadnought *Leonardo da Vinci* was destroyed by a torpedo. The same officer furnished the Austro-Hungarian Navy with the secret code between Serbia and Italy. It was only due to the bad weather which delayed his journey from Durazzo (now Druz) that King Peter I of Serbia did not fall into the hands of the Austrian destroyers watching for him just outside Durazzo.

The trustworthiness of the various sources of intelligence is quickly tested and established in time of war. For example, shortly after the outbreak of the war, the Austrian spy residing in The Hague reported that on a given day the English-French fleets would bombard the war harbor of Pola, but as a matter of fact, never at any time during the whole five years of the Great War did an enemy ship of any kind appear before the above-named naval fortification.

Therefore as time goes by, the trustworthiness of the various sources of intelligence can be judged from the correctness of their reports. Here, again, a question of the person and not the system.

Seeking out in time of peace all possible details which might prove subsequently of military interest is also one of the tasks of the intelligence service. Let us take an illustration from the late war to show how important a part in the military success even insignificant details play. On the day of Italy's declaration of war (May 23, 1915), when the Austro-Hungarian fleet had set out for the bombardment of the Italian coast, the armored cruiser *Sanct Georg* was ordered to destroy the railroad bridge near Rimini on the coast through artillery fire. According to the intelligence office (called "bureau of evidence" in Austria), this bridge could be seen quite plainly from the sea. The information, however, was quite incorrect, as the bridge was entirely hidden by houses which perhaps had been built either intentionally or otherwise, after the report had been made. The firing, therefore, had to be indirect, which, owing to the lack of observation on the side, was not altogether successful.

In former times Austrian naval officers were often detailed to fishing boats in order to study certain portions of the Italian coast. The Italians used the same system on the Dalmatian coast, but here they had a distinct advantage in that all the fishermen in the Adriatic spoke Italian. It is therefore, one of the tasks of the counterespionage service to exercise a sharp and continual control over all suspicious craft, their itineraries and crews.

Before the war the Italian Government devoted great efforts to intelligence work, and one must admit that these efforts were very successful. Even though the Italian Irridenta at that time were endeavoring to effect a

separation of the Austrian coast with an Italian-speaking population and espionage therefore found a very fertile soil. nevertheless one must give due credit to the successful activities of Italian espionage.

For example, before the outbreak of the war, Italian spies existed as construction overseers in one of the most modern naval forts on Brioni M'nore (island in front of Pola); as construction draftsmen in a technical committee in Pola; as auditors and foremen in the naval arsenal in Trieste; as officers and waiters on nearly all the merchantmen of the large Austrian shipping lines which crossed back and forth daily along the Adriatic coast and naturally could enter any harbor without restrictions. It has been indisputably proven that hundreds of such persons were guilty of traiterous espionage during the war and how many hundreds more there probably were who were in Italian pay and were never convicted. On August 1, 1915, the Italian submarine *Giacinto Pullino* ran aground on an island in the neighborhood of Pola and was soon discovered by an Austrian torpedo-boat patrol. The entire crew was taken prisoner and brought to Pola. Everyone was greatly surprised to find among the officers of the submarine a certain Captain Sauro, formerly captain of an Austrian merchantman. He had scratched his whole face with his finger nails so as not to be recognized. When he was confronted with his mother who lived in Capodistria, he denied knowing her, although she spoke of him before witnesses as her son. In accordance with existing military regulations, he was sentenced to be hung and was immediately executed. Nothing was clearer than this case. Sauro was an Austrian citizen and was caught "in flagranti" as he fought against his own country and directed the attacking enemy submarine through these waters with which he was so thoroughly familiar. The Italians have now erected a monument in Pola to this miserable traitor and have named one of the principal streets "via Sauro." In this way, Italy—the old nation of culture—honors despicable deeds that work to her interest. The Italians have also erected a monument to Oberdank, who more than a decade ago attempted to assassinate Emperor Franz Joseph I in Trieste and was quite justifiably put to death.

Nevertheless the former incident just cited shows how thoroughly the espionage service of a country can be organized.

No important changes were made in the general organization after the outbreak of the war except that the intelligence departments of the navy and army had to work in close cooperation.

In the case of the army during the war, there were opportunities daily for gathering information (principally through deserters always appearing at the time of an offensive action on the part of one side or the other, or through prisoners). It was found during the war that it was a waste of time and energy to question officers, which is of course as it should be. However, in the case of common soldiers one can always count pretty definitely on success, especially if the cross-questioning is cleverly conducted.

A second infallible method is that of "listening in" on the enemy's telephone conversations, such as orders transmitted to and from the front." This is accomplished by underground connections with the enemy's telephone system (mainly at night).

Airplanes are the surest medium of obtaining information about the movements of troops and ships. The movement of troops can also be estimated through aircraft observers, especially when the railroad traffic grows very active in any definite direction. Railroad workmen, etc., trained and selected by the intelligence service in time of peace proved the best for this kind of work. Very short and simple reports to the nearest intelligence station

in a neutral country (such as "Four kilos oranges purchased" or "Uncle left in good health") are the best and evade most easily the ever-watchful counterespionage service.

During the war the writer carried on a chess correspondence with a colleague on another ship. The chess indications noted on postals (for instance, 22–24) at length aroused the suspicions of the counterespionage and the matter had finally to be explained.

The entire espionage correspondence must be ciphered in an inconspicuous way. A favorite way was to use only the word which followed a dash. Otherwise such correspondence has little chance of getting out of the country if the counterespionage service and postal censor even halfway do their duty.

Very valuable material in the way of statistics, sketches, orders, instructions, etc., have been obtained from fallen officers or in officers' quarters after a successful advance. The examination of the enemy dead and prisoners as well as the questioning of the latter is the duty of the espionage organization. They must also search for any written material of interest after a successful advance.

An example, at the time of the twelfth battle of the Izonzo and after the successful advance of the Austrian and German troops, the attention of the Austrian intelligence officer was attracted to a newly made grave in the neighborhood of the former command of the Italian forces. This was astonishing that the retreating Italians took time to make this grave. The fact was all the more peculiar as the cross on the grave bore the name and charge of an Italian "tenente," but with a false regiment number. The grave was opened and everyone was surprised to find therein a simple wooden coffin. In spite of a certain reluctance, the officer in question ordered the coffin to be opened and inside it were found all the secret documents, books, plans, etc., and an exact list of all the spies residing in Austria. Of the 150 named, 87 were immediately arrested; the others got wind of it and got away. Through this find, however, the officer rendered his country an inestimable service, and the carefully constructed organization of the Italians was completely destroyed and put out of commission for months. From this time on the enemy also did not have such an insight into Austrian plans and operations as formerly.

We can see, therefore, that a well-organized and efficient espionage can render greater and much more valuable services during a war than even courage and bravery. Therefore too much attention can not be given to this branch of the service, and under no circumstances should it be relegated to a position of secondary importance. It would be entirely wrong to detail to this service officers who can not be put to more effective use elsewhere, for it is just such persons who can cause the very greatest damage in this very ticklish work. The greatest caution, amounting to almost mistrust of one's immediate associates, should be exercised, for success can only be attained when the details of each individual phase of the work are not betrayed. For instance, in 1917 the private apartment of an Austrian agent in Zurich was broken into and all the secret correspondence stolen. This single act (against which no legal action could be taken) lamed this carefully constructed organization for a full year. This shows that it isn't the effectiveness of the organization itself that counts, but the cleverness and special ability of the individuals intrusted with its execution. For example, an Austrian naval officer, speaking Italian fluently and often going to Italy as a wine agent, was able to render very effective service, although he was thrown entirely on his own resources and had no organization behind him.

It should be mentioned at this time that all such persons must operate entirely on their own resources. It is impossible for the state as such to support espionage, for such activities always cause a lot of dust if discovered, and the state can not appear as spiritus rector, if for no other reason than to prevent any political disturbances.

An exception along this line is the intelligence work of the official representatives (attachés); the naval intelligence officers attached to war vessels operating in foreign waters must work entirely at their own risk. They must be doubly cautious, as the mere presence of foreign naval officers in a harbor attracts the attention of the populace.

Russia (and during the World War, France also) used women for this work with great success. These were either society women who reported for this work from political motives or motives of self-sacrifice, or, as was largely the case, were of the demimonde. These latter had the greatest success, as they gave free rein to their powers of seduction. A very beautiful and elegant member of the Russian aristocracy (?), by exercising her seductive charms on an Austrian officer in 1909, obtained the most important plans of the East Galician fortifications then under construction, in spite of the fact that the officer in question had been distinctly warned by the Minister of War (von Galgalzy). His subsequent suicide could not alter things, as the fortifications could not then be rebuilt.

In the year 1916 and 1917 a French dancer succeeded in winning over to the Entente the former Khedive of Egypt (Prince Abbas), who had been dethroned by the English at the outbreak of the war. He even went so far as to take his oldest son out of school in Germany and send him to England. She also succeeded in persuading him to gradually release his aid-de-camp and entourage recruited from Austrian circles, all of whom had been in his service for many, many years. The Khedive himself was educated at the Theresianum in Vienna, and his wife was an Hungarian. This tremendous reversal in sympathies, mode of thought, and actions could only have been effected by a very subtle and designing woman. The Khedive would have certainly resisted any other influence.

One very important phase of intelligence work is the so-called political espionage, especially during times of political unrest; this occupies itself with influencing the opinion of a small circle of the population, the street, or best of all, the press. Numerous methods are used to accomplish this, such as paying gypsies to play and sing a certain national hymn, organized street demonstration, riots in front of public buildings or private apartments of prominent people, provocative articles in popular newspapers, bill posters, caricatures in comic papers, cinema productions for political propaganda, paid agents acting as servants for foreign diplomats, etc.

One can see from the above that political espionage is very expensive if it is to be successful. English diplomats have to thank their well-filled money bags for as much success as their admirable political abilities.

Prince Bülow, the German ambassador in Rome in 1915, naturally made every effort in his power in order to deter Italy from declaring war, even as the Entente diplomats were bending every effort in that very direction. The wife of Prince Bülow was an Italian and understood Italian psychology. When it became evident that the Entente were to be successful in drawing Italy into the war, the prince made a final effort and hired about 50 "giovanotti" (boys) armed with cudgels who were to break into Parliament during the decisive sitting and shout threateningly, "A basso la guerra" (down with the war). The English

ambassador got wind of this idea and shattered the German ambassador's scheme by employing three times as many boys and paying them three times as much. At the given hour an excited mass of people gathered in front of the Parliament buildings, but the advocates of war were in the majority and gained the day. This is what is known as preparing the will of the people. Owing to the lack of money, Prince Bülow lost the game.

Foreign espionage found a particularly fertile soil in former Austria-Hungary, for Czechs, Italians, southern Slavs, Rumanians, Poles, and Ruthenians were always flirting with their mother countries and esteemed it an heroic deed if they could stab the monarchy by some treasonable act. They actually competed with one another in their efforts to deliver secret reports to the enemy. High treason trials were a daily event, and the more critical the military situation was the more brazen and impertinent were the traitors. No other country even approximated the number of despicable traitors. No country suffered from treason more unjustly. There was hardly any military action which was not known to the enemy earlier and more clearly than to the Austrian officers. Under such circumstances the war could never have been won, and it was this very knowledge which did so much to cripple the "front" and break down its resistance. Treason in one's own country is the worst thing that can happen to an officer during a war. Austria's fortifications were surrounded by a barbed-wire barricade, not so much to keep the enemy out as to keep the Austrian soldiers in.

On the Istrian coast a few sea miles north of Pola a small portable radio station was secretly in operation during the entire war. This had been installed before the war, or had been brought there during the war, by an Italian torpedo boat. To all outward appearances this station was installed in a folks school with telephonic communications with Pola. The location of the instrument probably changed, because even the most assiduous efforts failed to locate it. In any event, the entrance or departure of ships to and from Pola was broadcasted to the world. For instance, the message "acquila, delfino, delfino" meant a destroyer and two torpedo boats have left Pola. The sense of this and similar telegrams was easily caught. However, the messages could not be stopped, as they were always dispatched when the atmosphere was quiet and were given out so rapidly that it was only on the rarest occasions that they were interrupted by any stronger waves. Nevertheless, during the entire war this arrangement enabled the Italians to learn immediately of the departure of Austrian ships and to take the necessary countermeasure.

There was also a signal station on Mount Lovcen (1,700 meters), in the Gulf of Cattaro, up to 1917, as long as this point was in Montenegrian possession. This station had a view of the entire gulf and was, apparently, also in telephonic communication with an Italian radio station in Antivari.

All ships therefore had to leave at night and with completely shaded lights; but even so, there were people (either among the population or the crews of the merchantmen lying in the harbor) who gave the Lovcen station the requisite signals by means of pocket lamps. In the German Navy also the movement of the vessels were communicated to the enemy, either through Dutch or Danish spies.

Under this class of intelligence service comes the question of sabotage through paid agents. During the late war, a number of cases of damage in the Austro-Hungarian Navy were found to be due to this. For instance, small bits of iron were found in the turbines or the motor cylinders of submarines, or the boiler of a destroyer was heated when empty, all of which things could only have been done through motives of sabotage. Minor acts of sabotage finally no longer were sufficient and, as already mentioned, the Italian dread-

nought *Leonardo da Vinci* was destroyed at Tarent on August 2, 1916, and the Austro-Hungarian torpedo boat *No. 11* turned itself over to the enemy completely. This occurred the middle of October, 1917. The torpedo boat in question was stationed in Sebenico, and at daybreak was scheduled to pilot a German submarine through the mine fields. At 4 o'clock it left its buoy and soon passed out of sight in the direction in which it was to meet the submarine. However, about 6 o'clock the latter reported that it had arrived at the given point and was awaiting the torpedo boat. It was therefore assumed that the torpedo boat had either run aground or had been destroyed by a mine. The latter, however, appeared improbable, as the explosion would have been heard or pieces of wreckage discovered. Three days later Italian newspapers reported triumphantly than an Austrian torpedo boat had delivered itself over to them. It was a great tactical error on the part of the Italians to report this so openly in the newspapers and not keep it secret, for otherwise the boat could have easily come into Pola and torpedoed ships in daylight. For even after all the years of antagonism between the Austrian and Italian navies, such an event had never been thought of even as the wildest flight of imagination. It is a mystery even to-day why the Italians did not take advantage of the event. The torpedo boat's commander (a German subject named Kärtner), upon his release from internment after the war and his return home, reported that on the eventful night in question, he and the second officer were rendered unconscious by a sleeping powder of some kind and were then bound and imprisoned in the officers' mess under the guard of a Czech noncommissioned officer armed with a revolver. The machinists and boiler men were also forced to follow instructions under guard of Czech crew armed with pistols and stationed in the hatchways. The command was taken over by a Czech noncommissioned officer (formerly in charge of the torpedoes), who directed the boat toward Ancona, which, however, he did not reach exactly. He therefore ran the boat aground several miles south of the harbor. The urgent request of the officers to be allowed to burn the most important and secret books and codes was only partially granted. Of the entire crew of 14, 8 were Czechs, who it was thought could be taken without risk, owing to the unimportant harbor work assigned this ship. This instructive, albeit sad, illustration taken from the annals of the war shows sufficiently what tremendous caution must be exercised in a country during a war.

An extensive sabotage action was undertaken against the Zeppelin station in the neighborhood of Cuxhaven in 1917. The entire terrain surrounding the Zeppelin hangar there was surrounded by shrubbery and trees a meter and more high. One night this shrubbery suddenly burst into flame in a crescent form at the lee of the hangar, and it was only with the very greatest difficulty that the fire could be controlled. It has never been learned whether the fire was started by some English flyer or by some paid agent.

The many attempts on the part of Entente flyers to set fire to the extensive grain fields in Bulgaria must also be classed as sabotage.

The airplanes were especially active during the war in scattering printed pamphlets. That such activity had a real effect is evidenced by the fact that those flight officers who were taken prisoner while engaged in this kind of work were always treated with greater severity than those engaged in purely military work. These pamphlets were solely for propaganda purposes. They were prepared continually in a special division of the army intelligence office and were always printed in the language of the country for which they were destined. They were then dispatched to the various "fronts."

Lord Northcliffe followed the same principle in a much more extended way while acting as British Minister of Propaganda during the last two years of the war. His energy and activity in this respect were enormous, and his success was tremendous. The many military successes gained by the troops of the Central Powers as a result of bravery and admirable leadership finally went down before the Northcliffe propaganda in the rear, which in correct appraisal of the psychology of the social-democratic population found a fertile soil for his crafty work. Finally, he attained with one blow what the combined armies of the Entente were unable to accomplish after several years of intense fighting; i. e., breaking the enemy's will. That well-filled money bags were necessary for this work goes without saying. However, the arrival of the American Army, which revived the weary spirit of the French and more or less brought about the final victory, was another factor in Lord Northcliffe's favor.

The most difficult thing during the war was the creation of a connection with the enemy for the purpose of obtaining reports, etc. During the war this was done by means of airplanes, which took suitable persons and let them down within the enemy's country. For example, in the summer of 1917 a number of fishermen were always at work in the Istrianian harbor Umago when this territory was free of mines. Italian torpedo boats often approached these fishermen and from time to time took some of them on board for a short time, which action naturally aroused the suspicions of the military authorities, who could see this whole performance from the land. Investigations showed that a certain individual named Grassi, a fisherman and father of a large family, was really the leader of an espionage organization or center. His oldest son at the time of the investigation was stoker on the battleship *Babenberg*, stationed at Pola.

Another remarkable case of communication between the Italian and Austrian Navies was discovered after the war. The sufferers were indeed the Austrians. The outer scouting service for the island district of Sebonico during the war consisted of three obsolete torpedo boats. Owing to their subordinate duty, the command was taken by the second officer if the commander were ill or off duty. The second officers were recruited almost entirely from the merchant marine, the crews of which, as already mentioned, being mostly of Italian descent and sympathies. Each time the commander was absent one of these boats met an Italian torpedo boat according to appointment at a given island of the Incoronate and delivered its reports. One of the most disgusting things, which was indisputably proven later on, was the fact that a certain Commander M. K., in active service but with distinct Slovenic sympathies, had been guilty of the most despicably traitorous behavior and had been in communication with the enemy the entire time. At the end of the downfall the newly created Yugoslavic Government "rewarded" him by appointing him commander of the fleet. Apparently K. was the head of a well-organized espionage service; in any event, the following fact shows that all-important and secret matters were known to the enemy within a very short period of time.

At the beginning of December, 1914, in the northern part of the Canal of Fasana, in the foreharbor of Pola and seaward from Rovigno, a shallow mine field was laid in order to shut off the reconnaissance trips of Italian torpedo boats in the fortified waters about Pola, which were just beginning at that time. These lines of mines were entirely secret and were laid at night; not even the commanders themselves knew the details. They were merely furnished with certain rayons giving the exact boundaries of the mine fields.

On December 23, 1914, some two or three weeks later, the French submarine *Curie* was sunk by gunfire at the entrance of the harbor of Pola. The submarine was raised later on, and one was more than astounded to find among its papers a chart of Pola whereon the location of the above-mentioned mine lines were indicated exactly by lead pencil. Airplanes, which were used very advantageously to locate the mine-free channels as a result of the extremely clear water of the Adriatic, and therefore knew these routes perfectly, went over to the enemy from time to time, and it was therefore plain that the enemy knew all the mine passages, steamer routes, blockades, etc., much better than some of our own personnel. For these reconnaissance flights the planes were manned mainly by noncommissioned officers, not only to relieve the already burdened naval officers but also to train a larger flight corps. However, as no distinction could or dared be made in the nationalities of the various noncommissioned officers (as every Slavic officer could not be viewed as a potential traitor), it transpired that one time or another such a plane flew directly over to the enemy.

These experiences of the war, especially the treason of the above-mentioned Commander K., are naturally denied to-day by the Yugoslavic Government; the Italians also have no interest in publishing the true history of the Austrian downfall. Therefore, in the years to come, the critics will continue to misjudge these past events. Even though the Entente powers (which to-day admit of no opinions but their own) continue to deny these things, nevertheless they will always remain in the memory and traditions of former Austria.

Even though foreign espionage found a most fertile and fruitful soil in the conglomeration of nationalities making up the former Donau monarchy, nevertheless the tremendous importance of a well-organized espionage service can not be denied.

The arrangements, in case of necessity, for a rapid and sudden alteration of secret signals and other highly confidential aids belong to the category of counterespionage. After each case of treason, such as the defection of torpedoboat *No. 11*, all routes and mine fields had to be altered by telegraph and the ciphers of the signal and telegraphic codes changed. The Austro-Hungarian Navy, anticipating treason in the event of war, had already worked out five different signal codes; these were designated as Code No. 1 to Code No. 5. At definite periods one code or the other became valid, so that knowledge of the old code was absolutely valueless. The same was true of the telegraph books and mines. The countersignals for the submarines returning from their cruises were regulated in advance for each night; for instance, the firing of a rocket with red and white stars followed by a letter of some four-letter word (Abel, for instance), to which the other boat had to reply by giving the remaining three letters.

The junction points of returning submarines with the torpedo boats which were to pilot them through the mine fields were also changed. The outer portion of each harbor had four to seven crescent-shaped concentration points at a distance of 20 sea miles from the harbor entrance and designated clockwise by large letters. If a returning submarine reported by wireless that it was returning about 2 a. m., the information was telegraphed it that promptly at midnight such and such a torpedo boat would be at point F. At the hour agreed on, the two vessels, after giving the countersignals, approached and entered the harbor together. By means of this system, the harbor or district command was able to pilot returning vessels through the mine fields. This system is furthermore necessary owing to the fact that during the cruise of the vessel in question the mine lines could have been changed. All the vessels

at sea can be informed by wireless of a change in the location of a mine field, but the information must remain a simple warning—the exact location of the mines can never be telegraphed. The system just described proved exceedingly satisfactory during the war and can be very highly recommended.

The German Navy, which also had to suffer from espionage, was far less prepared for it and naturally hadn't taken the measures necessary to insure a rapid change in the secret signals. The German cruiser *Magdeburg* ran aground near the island of Odensholm, in the Baltic, on August 27, 1914, and had to be given up as lost. At this time the signal book fell into the hands of the Entente, probably, through Russian fishermen. According to the "Marine Rundschau," the English found this book very valuable in the Battle of Skagerrak. It appears also absolutely unbelievable that the German Navy never changed or made any alterations in this signal book during the long course of the war.

It is extremely important to keep the location of the mines secret during a war, for if this information once becomes known to the enemy, then the whole thing is worthless. As much through treason as through unfortunate accidents (mainly through the loss and subsequent raising of a ship or submarine by the enemy) the charts of the mine fields can fall into the hands of the enemy; but since on the other hand, it is impossible for every commander of a vessel to know the location of the mine fields by heart, some method must be devised which will give a sketch of the mine fields and yet which can only be interpreted by means of some key word. In the former Austrian Navy, sketches were made on drafting paper which could be placed on the proper charts and in this way indicate the exact location of the mine fields.

These "Oleaten" were marked in such a way as to be easily identified, each indication containing several letters. For example, the words "Dienstag" or "Enropäisch." In using the first key word, "negi" indicated 4372 so that the draft "Die" (Dienstag) was to be laid on Chart 4372. In the draft "En" (Enropäisch) "orin" indicated 4382. The key words were easy to remember, so that the draft served the same purpose as a mine chart, but was unintelligible to the uninitiated and meant nothing if it fell into the hands of the enemy.

The Austro-Hungarian Navy was equipped in the most laughable way to practice espionage successfully, both in time of peace as well as during the war. Everything depended on the cleverness of the individuals engaged. The so-called naval intelligence bureau, which was in charge of this branch of work, had a maximum corps of 12 persons. Only a few pensioned naval officers were engaged abroad as agents during the war, but the only ones furnishing reports of any value were those in Zurich and Corfu. Besides the military attachés in neutral countries, the general staff of the army also had agents in Switzerland, Holland, Denmark, Poland, and Sweden. Reports from these sources which affected or were of special interest to the navy were passed on from time to time. The reports regarding the Italian coast and harbors, which had been gathered by the naval intelligence office during the years preceding the war, proved very valuable.

The movements of enemy naval forces were reported mainly by flyers in so far as it affected the immediate territory in question. Otherwise the intelligence office kept a list of the positions of all warships, which was kept up-to-date from newspaper reports and information from agents. These lists were in duplicate and were mounted on cardboard; at the left there was a rubric with the names of the ships arranged alphabetically, the source of the

information, the location, and, lastly, the date of the arrival or departure. The fleet command had always one copy, while the intelligence office had the other, and kept it up-to-date by means of pencil annotations.

Reports furnished during the war regarding the contemplated operations of enemy forces practically never were correct. If any special activity is noticed in the fleet one can assume some operation is imminent .

The navies of the Entente were undoubtedly better informed in this regard owing to their various sources of information. It is therefore all the more peculiar that Austrian ships were interfered with so slightly in the Adriatic. In the two years of Austria's occupation of the Adriatic, reserves were transported by sea almost regularly for the army operating in Albania, owing to the lack of railroads or roads. These troops were sent by water from the Gulf of Cattaro to Durazzo, 90 miles distant. These transports only set out after sunset; otherwise the enemy would have known that the convoy consisted entirely of obsolete destroyers and several torpedo boats. It could only have been through a lack of military spirit on the part of the Italians that they failed to attack these transports, consisting often of from two to five ships. It would have been a very easy thing to have interfered with this service to such an extent that it would have been necessary to have withdrawn the Austrian Army from Albania altogether. This would have left the Bulgarian Army in Saloniki in the air, and the "front" there would have had to be given up much sooner.

In conclusion, it may be said that successful espionage is due more to the proper choice of agents than to the organization itself. All the successes which Austria-Hungary had along this line during the war were due purely to the persons who recognized an opportunity and took advantage of it. The other countries participating in the war undoubtedly had the same experience. Another point is that only unlimited funds can lead to success, for the professional agents and all those persons taking up this work for the sake of money are very doubtful and untrustworthy people. Bribery therefore plays a great rôle, and the persons paying the most money will receive the better service. Before the outbreak of the war with Rumania, the Austrian Government (as far as is known) endeavored to bribe the Rumanian press with 5,000,000 gold crowns in order to influence popular opinion, but along came the English with their bulging money bags and paid ten times as much when necessary. But all such elements aside, the past war has proven clearly how tremendously important and valuable a well-conducted espionage organization may be.

The incidents cited in the course of this article form a brilliant picture of the events of that time, but all are based on the naked truth, and documentary evidence for each and every one can be furnished by the author.

It will, furthermore, be a great satisfaction to the author if this very sketchy account of events can be passed on to future generations and serve as a slight correction of the reasons given out by the victorious states for the downfall of the Central Powers in the autumn of 1918.

BRAZIL

LONG DISTANCE AIRCRAFT FLIGHTS

April, 1924

About the only instances of any long-distance flying of any consequence that have been done in Brazil are the flights made by the Brazilian aviator, Edu Chaves, from Rio de Janeiro to Buenos Aires; the flight of Lieutenant Hinton, accompanied by Martins, from New York to Rio de Janeiro, following the coast of Brazil from its northernmost point down to Rio de Janeiro; and the flight of the two Portuguese aviators, Almirante Gago Voutinho and Sacadura Cabral, following the coast of Brazil from Fernando Noronha to Rio de Janeiro.

The flight from Rio de Janeiro to Bennos Aires, or vice versa, had been tried six times before success was attained, one of these times by Edu Chaves himself, in a French machine. Edmardo Hearne, the Argentine, came the nearest to completing the trip in an English "Bristol fighter," but failed when within about 280 miles of Rio de Janeiro on account of a forced landing at Sorocaba. Two pilots lost their lives trying to make the trip after having passed the halfway point and the worst part of the trip had been made. They had landed in a lagoon to let a storm pass, and in starting up again one of the men was knocked into the water by the propellor. The other jumped in to save him. The machine drifted away from them and being unable to reach it again by swimming, they both drowned. They were flying in a boat manufactured in Italy.

Lieutenant Delamare, of the Brazilian Navy, attempted the flight in another Italian boat, and after a very trying trip of over 26 days' duration, came to grief at Rio Grande do Sul. The machine was dropped by a cable breaking while being hoisted from the water preparatory to undergoing repairs on the hull.

The other three attempts were made in French and Italian machines. Two were unsuccessful on account of forced landings from motor trouble, and the third was the result of the pilot overloading the machine.

The first and only time an American-built machine was used occurred in December, 1920. The trip was made in five succeeding days from Rio de Janeiro, with stops at Sao Paulo, Guaratuba, Porto Alegre, Montevideo, and Buenos Aires. This was the flight made by Edu Chaves in a Curtiss "Oriole," given him for the purpose by the government of the State of Sao Paulo. The American machine went through with only stops to replenish the fuel and to

give the pilot time to rest. The distance covered by this flight was 1,100 miles.

There is no country where the airplane can be used to such a great advantage as in Brazil, where natural conditions make the construction of railway and automobile roads so difficult.

At present there are over 200 airplanes in Brazil, these being divided between the army and navy, with perhaps as many as 30 of this number belonging to civilians. There are also in existence nine aviation fields or water stations in Brazil. There are many other fields in different towns in the interior of the State of Sao Paulo, but these fields at present are not being used.

GERMANY

THE GERMAN NAVY IN THE DARDANELLES

[Translation of an article by Lieutenant Commander Schneider, German Navy]

When the enemy began preparations for the Dardanelles offensive in February, the responsible officers in charge of the defense were thoroughly aware that the enemy was bound to be completely successful if their operations were carried out on a large scale and inspired by a spirit of determination. However, the English command failed again even as in 1809. Halfway measures and the fear of attempting anything were the causes of the failure.

The significance of the wedge driven by Germany between the western powers and Russia through her activities in Turkey was not recognized immediately in its full strategical significance. France is to blame that the western powers did not decide more quickly to commence operations against the Dardanelles. This delay gave Turkey the opportunity of strengthening the fortifications through the installation of new guns and the training of the personnel.

England, unlike France, was not bound in the chains of a European mode of thought. It is quite probable that when the Turks began to march on the Suez Canal in November, 1915, Churchill would have decided on action against the Dardanelles if the necessary naval forces had not been lacking at the time. The echo of the battle of Coronel had reacted on the English Admiralty and had caused them to place all available ships in service against the cruiser squadron. The English armored cruiser *Inflexible*, which had taken part in the demonstration against the outer Turkish fortifications on November 3, was en route to the Falklands a few days later. It was only after the battle of the Falklands had been fought and the flag of Count Spee had disappeared from the sea that England again had sufficient ships available to drive a blow against the Turks, which was destined to relieve the Russian left wing and open the

way for imports and supplies to reach Russia by sea. If the blow had been struck quickly and sharply, the defense would have been broken at Tschanak.

The fortifications were in no way ready for a modern battle. The guns which had been furnished the Turkish Government by representatives of Krupp, Schneider, and Creuzot and Vickers & Son, were formed indiscriminately into batteries without regard to caliber and system. This disregard of the most elementary rules of artillery rendered firing difficult during a battle, as well as the exchange of ammunition and reserve parts, and diminished the fighting qualities, which were already low.

The open earthwork whose breastworks extended above the traverses could be easily seen with a good glass, even from a great distance. The angle of enfilade of the guns, which were mounted on cement foundations without any protection, was limited. The heavy calibers demanded an extensive personnel. In contrast to the hydraulically moved guns of the ships, with their highly magnifying telescopes, the guns of the fortifications could only be moved by hand in accordance with indications given by the chief firing officer regarding tangent and muzzle sight. This made errors often unavoidable, inasmuch as the English could choose their own time for attack and thus assure for themselves the most favorable conditions of visibility. They did not need to economize on ammunition. Our small rations of ammunition, on the contrary, forced us to the greatest economy. We were obliged to transport munition by hand, while on board the enemy ships this was done by machinery. This inconvenience decreased the firing velocity. The English and French artillery officers had the finest range-finding and fire-control instruments at their disposition. The Turkish officers were obliged to calculate the distance and then directed the battery fire from a traverse merely by shouting their orders. The orders communicated to the guns were often lost entirely in the din of the battle. Therefore, in every particular, the enemy ships were superior in point of artillery. They could veritably suffocate the Turkish batteries under an iron hailstorm. The shell weight of a single broadside of the most powerful vessel in the Dardanelles action, the *Queen Elizabeth*, was 7,442 kilograms. In the same period of time in which the most powerful Turkish fort (Fort Hamidie) fired once, nearly six broadsides could be fired; the single explosive shell had almost a man's height and weighed 800 kilograms.

Besides Anatoli Hamadie, the Medjidie and Hamidie batteries on the European side and the outer works (Ertogrul and Orhanie) were fairly good. Their armament consisted of Krupp 24-centimeter cannon of the eighties, with a firing range of about 14 kilo-

meters. Besides, in the two forts Hamidie there were also five 35-centimeter guns with a firing range of 18 kilometers. The elevated outer works, Ertogrnll and Orhanie, could be flanked at short range without themselves being able to return the fire. Hamidie and Medjidie could also be destroyed by fire from long range ships' guns beyond their firing range. The other batteries had no fighting power. Located at the narrowest point of the straits, their shells fell mostly on the inside. Their firing range only amounted to 7 kilometers. Later on, they were removed to the defiles of the Karsthock plains of Gallipoli and the heights of In-Tepe and Erenkoi; their range at this place was sufficient to extend beyond the Narrows. The ravines running diagonally to the coast protected them from flank fire. A concentration of power could be gained by the laying of mines within their range of fire. These measures were only carried out after the Dardanelles offensive, when the necessary funds and time for the constructive work were available. Up to that time we had to limit ourselves to putting portable howitzers and light guns in position.

A part of the necessary mines were delivered to us by the enemy. Mines laid by the Russians in Trapezunt were taken up by Turkish naval officers and men and brought in an open motor boat 500 miles over the Black Sea to Constantinople. French mines were also removed from the Gulf of Smyrna and Bulgarian mines captured in one of the late wars were also put into condition and used again.

Turkey did not have the other aids of the allied fleets at her disposition. Her power had been badly crippled through the former wars. All connection with Germany was shut off until the defeat of Serbia and the opening of the Donau. Besides mines and material, ammunition was urgently needed for the submarine net blockade. The German chief headquarters and the Imperial Navy Department tried in vain to obtain war material through Rumania. The ammunition went to Rumania packed in cement blocks, beer kegs, or between the walls of railroad carriages, but never reached its destination. Treachery, unfortunate circumstances, and stupidity were the causes of the failure.

Turkey had to depend on itself as before. Energy and inventiveness had to bridge over the deficiencies. Under the direction of Captain Pieper, of the German Navy, shell factories sprang up all over the country in the various electrical and railroad shops. Even though this ammunition was not of the best, still it helped us over the first difficult days and months. The wire ropes, etc., used in mining operations were taken to be used as material to form submarine blockades.

Fuses, contact caps for the mines, and other small objects of fine technical construction were carried by the couriers in their luggage over Rumania, or brought by small submarines. Eight 8-centimeter and ten 5-centimeter rapid-fire guns were placed on wheeled gun carriages which had been captured in former wars and had been in a museum for over a century. Tin cans in which English and American delicacies were packed returned to their makers as hand grenades.

Everything was an emergency measure. Where no substitutes could be found, determination and a correct estimate of the enemy equalized things. For instance, the fortification Tschanak had only 12 long-range explosive shells for the single heavy gun. Theoretically during a battle this would last for about 30 minutes. Realizing that the ultimate decision rested with the Dardanelles, and in correct estimation of Russian leadership, Admiral von Usedom ordered the fortification Bosphorus to turn over its entire store of explosive shells to the Dardanelles. This amount was not very large, but it helped over the critical period. This decision sounds a simple matter, but the responsibility must have been very heavy. There was also the worry that the enemy knew of the weak condition of the defense, as the English naval mission, under Admiral Limpus, was in Constantinople while Turkey was mobilizing. This mission had exact information regarding the fighting power of each fortress.

Another difficulty was the difference in language, customs, character, and, last of all, religious beliefs. Many restrictions and much friction can be laid to this. During the early preparations after the arrival of the special naval command, many interruptions occurred during firing practice owing to the penetration of powder gas between the closing cap and the metal of the tube, which was due to insufficient lubrication. Such errors never occur under the thorough care of German personnel. The explanation of this negligence was as surprising as it was simple. In the opinion of the Turk, pork is unclean and its use in any way is distinctly forbidden by the Koran. In the belief that we were using pork fat, the Turkish gunners felt it their duty to Allah to do away with this fat during the night without the knowledge of the German officers in control. Only when they could be convinced that this was beef tallow did all these interruptions cease.

In the Turkish reports it was not always easy to distinguish fact and fable. A false viewpoint, insufficient judgment, and oriental fantasy were often the cause of the most impossible reports. Often oriental education was also the cause of false reports. From youth on, the Turk is taught that it is an affront to the teachings of the Koran to tell another frankly anything unfavorable or unpleasant.

Therefore, in spite of explicit questioning, losses or interruptions in battle were only reported piecemeal by the Turkish commanders of the batteries.

"Effendi, only a small wheel is out of commission," was the reason given by one battery for the breaking off of the battle of March 18. During the night the wheel grew to a gun carriage, and during the course of the following day and night to two more or less badly damaged guns. We can not understand such a viewpoint, even as the oriental can not understand why we exaggerate everything. The "Jawasch, jawasch" (slowly, always slowly) brought us often to the point of desperation when the execution of some order did not keep pace with our own wills. However, the value of the Turk as a soldier did not suffer from this—the Turkish artillerist and mine crews fought most admirably.

The official language for all written communications with the Turkish ministers and underofficials was Turkish. All our inquiries, proposals, and instructions had to be translated by us from German into Turkish. How many misunderstandings this led to and how cumbersome were all business communications. Important communications, after having been translated into Turkish, had to be retranslated into German by a third person to check their accuracy. For the translators, this work was neither easy nor pleasant. How very often did they not stand between two fires.

Let us now take up briefly the political occurrences which led to the creation of the special naval command.

When Russian armament and equipment had advanced sufficiently (thanks to the millions advanced by France) to further a war with the Central Powers, a ministerial discussion was held in Petrograd in February, 1914, as to how one could obtain control of the Dardanelles. The Czar decided in favor of a forcible opening in case Turkey, in preserving her neutrality, should close the straits. The possession of Constantinople had always been one of Russia's imperialistic dreams. Every movement, however, that Russia made in that direction caused England (in spite of a community of military interests) to strengthen Turkey's neutrality and sovereignty on Gallipoli in order to create a second Gibraltar there for later times.

Turkey had to submit helplessly to this or fall in with the Central Powers under far less favorable conditions.

This was the reason which inspired certain of the leading statesmen, principally Enver, to look into the proposals of the German ambassador, von Wangenheim, who was endeavoring to bring Turkey into the war on the side of the Central Powers. The Dardanelles also had a very decisive significance for Germany. If the

straits were opened, then a world war along purely military lines would go against us.

The gigantic Empire of Russia required supplies of ammunition and weapons. The Murman railroad was then in process of construction, the Baltic was closed off by our fleet, Sweden allowed no transportation through her territory, and the long distance through Siberia was hardly practicable. The necessary war material could only be dispatched with sufficient expedition through the Dardanelles if Russia was to make the offensive planned for 1915, a deadly and fatal one for Germany.

On August 3, 1914, Wangenheim could report the signature of an alliance with Turkey. The opposition of the leading Turkish statesmen, whose sympathies were with the Entente, had to be reckoned on. They were backed by the diplomats and representatives of the enemy powers in Constantinople. Their influence could only be equalized through special events. Therefore, von Tirpitz caused instructions to be issued to Rear Admiral Souchon, at that time chief of the Mediterranean Division, to attempt to break through to the Dardanelles with the *Goeben* and *Breslau*.

However, before these orders reached him, Souchon, of his own initiative, had bombarded Bone and Philippeville in the early morning hours of August 4, and very seriously interfered with the transportation of the Algerian Corps to France. He was forced to coal again in Messina under the greatest difficulties and lost a great deal of valuable time.

English ships were reported outside bearing the flag of Admiral Milne. These ships were superior to the *Goeben* in speed on account of the damage to the latter's boiler. Souchon therefore requested assistance from the Austrian fleet. This was refused. Admiral Haus was unable to assist on account of the location, distance, and state of preparedness of his fleet.

Extra editions of the Sicilian newspapers appeared bearing such headlines as "In the jaws of death," "Last journey," "Shame or extinction," "The somersault from the pinnacle of fame."

It required iron nerves to preserve the requisite calmness and strength of purpose in the face of conflicting feelings to make decisions and keep up the spirit of the men. On the top of everything else, the following message was received at 11 a. m. on August 6, from the German admiralty staff: "Impossible to enter Constantinople at this time for political reasons."

However, Souchon's own political and military considerations pointed definitely in that direction. To enter the Adriatic under the existing circumstances without the support of the Austrians was equivalent to self-destruction. On the other hand, if the ships

reached Constantinople, they could maybe give the blow which would precipitate Turkey's active participation in the war.

The ships left the harbor of Messina at 5 o'clock in the afternoon, accompanied by the shouts of the populace. They succeeded in eluding the enemy's watch guard during the night. Milne waited in vain for Souchon 300 kilometers farther north, at the roadsteads of Otranto, in order to catch him and destroy his ships as he entered the Adriatic. It so happened that the admiralty staff had prepared coaling steamers at various points in the Mediterranean for the use of the Mediterranean Division. Cape Meleas was sighted and, with it, the coaling steamer. In passing, the latter received the order to lay by. During the night she was brought up by the *Breslau* and the ships coaled again, and again arose the question, can one reach the territory of the Turkish fortifications before Milne? Finally, at 4 p. m. on August 10, the islands Tenedos and Imbros, the Trojan Plains, and the Hellespont were sighted. The break through had been successful. It united Germany with Turkey. Courage and luck had won a great military victory.

The Turkish ministers were then faced with weighty and difficult decisions. The ambassadors of the enemy powers urged immediate internment of the German ships, or expulsion. If Turkey did not accede to these demands, it meant a break in diplomatic relations. It was the aim of nearly all the ministers to prevent this as long as possible on account of the lack of preparation for war. Therefore, the same night, the German Embassy was requested to give permission for complete disarmament, in appearance only. After careful consideration Wangenheim refused this request. The proposal of the Minister of the Navy Djemal Pascha, to regard the ships as the delivery of an order already given to Germany, came as the greatest relief; this furnished the base for a friendly solution of the question. Germany agreed the same night under the provision that Admiral Souchon should be taken over in Ottoman service. The next morning the ships anchored before Dolma-Bagdsche. The fictitious sale meant that the German officers and men had to lower the flag under which they had served with such honor. From now on they fought under the red flag of Turkey and wore the red fez of the Turks. The *Goeben* was rechristened *Javus Selim* and the small cruiser *Breslau*, *Midilli*. The latter ran on a mine and was sunk on January, 1918, during an advance outside the Dardanelles.

With the change in flag, Admiral Souchon's activity as instructor and reorganizer of the Turkish fleet began.

Contrary to German custom, the occupation of the Turkish coast fortifications was in the hands of the army. This division, and the fact that the coast artillery as land troops were not famil-

iar with naval practice and requirements, represented a decided weakness in the Dardanelles defense, which had to be done away with. At Souchon's suggestion, therefore, the Sultan requested a German admiral to take complete charge of the defense, and also demanded German naval coast artillerists at the same time. This was the creation of the special naval command of Admiral von Usedom. Under his command, as commander in chief of the Dardenelles and Bosphorus, this naval command was organized in Berlin in August, 1914, and consisted of 26 officers and 432 men. Vice Admiral Merten was detailed as commander of the Dardanelles fortresses.

The transportation through Rumania was very difficult. Officers and men posed as engineers and workmen ordered by the Turkish Government for their arsenals. After their arrival in Zeitin-Burnu they were conveyed under cover of night on board a German steamer that left at once for the Dardanelles. This secrecy was necessary. The diplomatic relations with our enemy States were not yet broken and the Turkish statesmen strove to prevent this as long as possible. Therefore our people were kept hidden in an old Turkish fortress in Bosphorus and in the Dardanelles until they were dressed as Turks. They were given the effective uniform of the Turkish artillery—brown-green with a blue collar bearing a bursting shell, as symbol of the heavy artillery.

It was difficult for our people to become accustomed to the different mode of life. Turkish food was especially unpalatable to them. The living conditions in their quarters also caused them much discomfort. No campaign of destruction had ever been waged against all the household pests, and as a result these were to be found in all the seams and interstices. The Turk never kills an animal. Our people had very little understanding for such considerations based on a religious belief.

The original intention was to distribute the German artillerists as gunnery officers at the various Turkish batteries. However, in consideration of the diversity of ideas, this plan was abandoned in order to remove all possible causes of friction. Therefore, in September, they were all sent to Fort Hamidie, where they lived partly in barracks and partly in tents. In this way the strongest fortress in a military sense was almost entirely in the hands of the Germans.

Under the direction of Lieutenant Commander Wossidlo, artillery training and firing practice were held here for the Turkish officers and men, to whose training little attention had been paid in the past. At the same time German workmen renovated all the guns of the other fortresses and got them in working order. It was a great advantage that the guns were comparatively simple to operate and

required no technical knowledge such as was necessary in the complicated guns of the ships.

For the most part the Turkish soldier lacked understanding for technical niceties and for thorough and particular care; a purely mechanical understanding was as much as he was capable of. This was especially evident in mine operations. This furnished a very grateful but exceedingly strenuous field of activity for the German torpedo personnel under their tireless leader, Captain Gehl. Just what this work amounted to can scarcely be appreciated from the notation in a war diary of December, 1914: "We succeeded in reconstructing 145 mines from the material found in various places." and yet what significance have these small figures compared with the number of mines which were really necessary? Our mine blockade should have equalized the weakness of our artillery defense. However, they had to be placed comparatively close to the inner works, as only light guns were installed as blockade batteries and needed the protection of the mines. Close to land there was still a narrow space left open for international shipping. Turkish war vessels delivered searchlights (for blockade illumination and torpedo-launching tubes which were installed as torpedo batteries at the narrowest point—Kilid Bahr, only 1,350 meters wide).

The fort here, with its battlements, was constructed of granite and marble to last for all ages, by Mohammed the conqueror, in 1462. A little Turkish village with its friendly, bright-looking houses and surrounded with black cypress trees nestled against the walls of the fortification; there was a 15-centimeter battery on the summit of the mountain located just behind. Opposite Kilid Bahr lay the sister mountain Kali Sultanie, standing out against the tableland of Asia Minor. These monuments of bygone centuries proved impregnable in the stormy offensives of March and April of the memorable year 1915. No *Queen Elizabeth* with her heavy guns could shatter its walls, whose strength and power had been gained for our side by a lucky coup.

Tschanak, the pottery town, lay close by the fort. Its name was due to the ceramic industry already famous in the Seljukian period. It presented an attractive picture from the sea, with the charming villas of the consulates, the bright-colored wooden dwellings of the Turks, and the many landing bridges, while an extra touch was furnished by the peculiar appearance of the various Turkish sailing vessels tied up here. This craft reminded one of the days of Homer, with the high prow and stern. In Tschanak, as in all villages near the Dardanelles, the Greeks were in the majority. As the battles began, all non-Turks were expelled and transported to Asia Minor. These measures seemed hard but were necessary in a military way

owing to the necessity of great secrecy. The town was almost completely destroyed during the course of the battles. Only the water front remained intact, strange as it may seem, and always presented a very peaceful picture to those coming from the direction of the Sea of Marmora. The Greek quarters suffered especially, and their stone constructions appeared prosaic and dreary next to the poetry of a Turkish village.

Behind Tschanak, the land began to rise. From here, one had a wonderful view of the Narrows, which had the effect of a gigantic river at Nagara where the width was 2,000 meters. The net blockade was laid here, where (although wider) the current and anchorage were better than at Tschanak. Nevertheless the difficulties were still great; the self-made nets, constructed of old wire ropes, were often broken by the strength of the current and the storms, and the buoys and anchors were often thrown out of position. Their installation, etc., was exceedingly difficult owing to the primitive aids at our disposition. The anchors were all old, having been formerly used by Turkish sailing sloops.

On September 4, 1915, the English submarine *E–7* got caught in our net as it was about to dive under. We could watch everything that happened in the waters adjacent to Fort Nagara by the movements of the buoys. Now, the boat had caught the net curtain; it felt the interference. Slowly it slid back in order to free itself, but still the blockade buoys followed; the boat is caught. The energy of the commander increased and again and again the boat pushed forward, tearing the net in pointed angles as it pushed forward and back so that the buoys were shortened and the wire ropes strained to the limit. In vain. Exhausted, the boat finally gave up and everything became quiet. The buoys were quiet as before. Nothing on the surface revealed the fact that at a depth of 50 meters there were living men waiting in anxiety for their fate.

Then at midday a small German submarine arrived, one of the boats constructed in Pola. They were like nutshells, and it required every bit of courage the crew could summon to go in them at all. They were propelled by a single motor; and if this failed to operate, then the boat was lost. The commander of the boat, Lieutenant von Heimberg, heard of the catch. He pictured vividly the feelings of the enemy commander. Two days previous, he had also been caught in an English net at the entrance and, like the *E-7*, had tried repeatedly to free himself. Just as the coils of his motor began to heat through and he wanted to give up any further attempts and rise to the surface in order to get out of this terrible depth which grasped the boat in its toils, the renewed determination to put up a fight won him the victory. He actually

tore the net work which was made of the best material of English factories. His boat was free.

We now asked him how our poor material would withstand the efforts of the English boat whose size enabled it to attack the net with twenty times the energy and force of Heimburg's boat. The day passed. Nothing moved. Probably the English commander, hoping to have deceived us, intended to rise to the surface at night and free himself. The Turkish craft began to gather above him. We had received explosive shells from Heimburg. The first was ignited at a depth of 40 meters. After the explosion, large bubbles rose to the surface. Then the waves quieted down again. No boat appeared. Another shell was fired. It was already getting dark. Then suddenly a gray tower appeared, hardly discernible in the twilight. "Light and operate searchlights." Quickly the three 7-centimeter machine cannons began to operate, only to stop short suddenly—the usual annoying interruption.

However, the turret hatchway had been sprung. Anxious men pushed through the opening and raised both hands. Distorted faces were lighted up by the searchlights. The water already began to gurgle around the boat; her brave commander opened the valves. He was the last to leave the sinking vessel. A tense experience was over.

September, 1914, was approaching its end as Admiral Merten was in a position to report the Dardanelles ready for action. The Narrows were still open for international shipping. So long as the passageways were not closed, the fortifications and Constantinople itself were open to a sudden and wholly unannounced attack by the English forces lying at Tenedos. Nevertheless, the Turkish chief headquarters could not decide to consent to Admiral Merten's request to close the passageways. Chance brought assistance. English destroyers held up a torpedo boat of the fortification just outside the Narrows and delivered the announcement of the British Government that every Turkish war or commercial vessels leaving the Narrows would be considered an enemy.

This information gave the desired occasion to Admiral Merten and the Turkish commander of the fortress, who of their own initiative closed the Narrows by mines and faced the Turkish chief headquarters with the fait accompli. This step probably also played its part in deciding Turkey's attitude in the World War.

At every defeat on the main fronts the German command had to reckon on the fact that the Turkish statesmen who were opposed to the war and under the influence of the foreign diplomats would get the upper hand. Therefore they had to press for the quickest possible break of relations with the enemy States, although Turkey's

military preparations for the war were not yet completed. It was therefore an anxious period for all when Admiral Souchon, with a rapid grasp of the general situation, interpreted the arrival of Russian forces at the Bosphorus as an inimicable act and fired on a Russian mine layer. Therefore, the die was cast on October 28.

Turkey's entrance into the war relieved our battle fronts. Its main work, however, lay in tying up the Dardanelles. In order to burst this hold, England, France, and Russia joined together in December, 1914, for a joint attack with the aid of Russian forces from the Bosphorus. In the same month, the fleets of the western powers which were detailed to carry out the attack formed together under the command in chief of Admiral Carden. Now, we had to look forward to some serious military work.

On December 13 an English submarine plunged under the mine blockade and sunk the old line ship *Messudie*, which was being used as a floating battery near Fort Hamidie. But since that time there had been two months of quiet. There was only the report of the arrival of further ships at the Grecian islands Tenedos, Imbros, and Lemnos, used by the British as bases since September. Merten had no opportunity to verify these reports through airplanes, but with the aid of a good glass one could distinguish a number of larger and smaller ships; otherwise there was no indication of an impending attack. The quiet was misleading.

February 19 the Minister of War (Enver Pasha) and Admiral von Usedom were at the Dardanelles. Just as the torpedo boat was about to take us to Kum Kali the yellow and black smoke clouds of bursting shells suddenly appeared above Kum Kali and we heard the thunder and reverberation of distant cannon. Gigantic columns of water sprang up around us and fell with loud splashes amid the whizzing of shell splinters.

The attack had begun. Flyers crossed above us and directed the fire of the English and French ships which lay in the dead angle of the batteries and, flanking them, fired at them at close range. The shells of the *Agamemnon* tore up the classic soil of Troy. Ships also appeared in the north. Their fire was directed against the batteries on the southern point of Gallipoli. A portion of the walls of the old Osman castle, where we had just stood, fell in pieces. A wide hole was torn in the powerful tower. The cannons only ceased firing at nightfall. Carden's ships withdrew; they had attained no success.

Our losses in men and material were slight. Lieutenant Woermann had been killed at Orhanie, which had been occupied by the Germans since January. The day following he was laid to rest under the Turkish flag near the burial hill of Achilles, with his face turned toward Mecca.

There was a very heavy sea during the next days. It seemed as though Poseidon had again come down from his seat among the gods at Samothrace and wanted to mingle in the fight between men. Heavy clouds hung over the Iaage Mountains. Carden had to wait and had to postpone the second attack to February 25. On this day, the guns began again. Once more the ground aronnd Seddul Bahr and Kum Kali shook from the effect of the bombardment. At midday, success seemed certain. The breastworks of Orhanie and Ertogrul were torn away. In order to give the finishing shot, English ships came along toward the front. But the impossible happened. Springing to the gnns from their bombarded quarters, Germans and Turks caught the enemy with success. But as the snn was sinking to rest behind Lemnos, the outer works fell. Seddul Bahr, "the gateway to the sea," existed no more. Constantinople's safegnard now rested merely with Tschanak. Will the enemy break this by means of a powerfnl advance or will he consider it more advisable to remove the Turkish mine blockade and destroy systematically the main Turkish works on the inside?

The latter days of Febrnary brought an explanation. Admiral Carden and his French colleagne, Admiral Gonbrette, had decided on a systematic action. On February 26, the *Majestic* was the first ship to pass the entrance, with nnsic on deck. A division of marines landed at Kum Kali and destroyed the gnns which were still intact. Reports of the victory were dispatched to London. In expectation of the impending entry of the victorious fleet to Constantinople, Mrs. Morgenthau, the wife of the Anerican anbassador, had the windows of the British Embassy cleaned. All Pera was afflutter with excitement.

However, we knew that things would not happen qnite this way. The enemy only reckoned on the fortresses near Tschanak, having no idea that Colonel Wehrle had set np 15-centimeter howitzers and Bulgarian cannon in the ravines of In-Tepe, Erenkoi, and Tenker, and they did not know that a 15-centimeter rapid-fire battery had been put on the hill of Dardanos since the departnre of Limpus. The enemy mine sweepers thought it would be an easy job to remove the weak Turkish mine blockade. Fire from the newly installed blockade batteries forced them to retreat. The losses were so heavy, which the mine sweepers and the protective torpedo boats and cruisers had snffered, that the crews had to be made np of volnnteers.

Wehrle's howitzers and the Dardanos batteries gave the ships in Tenker and Erenkoi Bays no rest, and in this way made the systematic bombardment of the inner works all the more difficult for the enemy. These works were then bombarded indirectly across the isthmus, observation being carried on by captive balloons. This blow

was also parried. The line ship *Haireddin Barbarossa* (the former *Weissenburg* of the German Navy) directed fire on the enemy from the heights of Gallipoli and scattered the enemy's fire irregularly over the territory. If the bombardment had been well directed, the works would have fallen.

Therefore valuable weeks were lost to Carden. Besides the mine sweepers, torpedo boats, and cruisers other vessels had been seriously damaged through the efforts of Captain Wossedlo, the commander of Hamidie, his Turkish colleague, the commander of the Medjidie battery, and Wehrle. Russia was also pressing: a decision was urgently necessary. Large freight steamers lay in the Mediterranean harbors waiting to bring the guns and ammunition to Sebastopol for Russia's last advance against Hungary. Churchill in London also advocated greater energy of action. Admiral Carden was replaced by Admiral de Robeck, well known as a reckless plunger.

On March 17 a council of war was held on Tenedos. In accordance with instructions from London, all available forces were to be used the following days for an energetic advance against the fortress. On March 18 the sun rose and poured its splendor on the bright flowers which only a springtime in Asia Minor can produce. Still we had no idea of the enemy's plans. We never even had exact information regarding his strength. The day before an old flimsy Gotha machine finally arrived in Tschanak after an adventurous flight over Rumania. It had to get information for us immediately. There was no time for overhauling.

We went up very early. The hinterland of Tschanak spread out below us. Far down beneath we could see the conchiform towers of Kilid Bahr. The roadways through the thin underbrush of the wild and rocky plains of Gallipoli gleamed white in the distance. We drew in at a height of 1,600 meters—the motor had reached its limit. Now everything was attention. We counted 40 vessels lying at anchor near Tenedos. All types were represented. Besides the powerful line ships and light cruisers, there were heavy transports, repair ships, and airplane carriers. Directly under us we could see the shadow of a submarine in the water. The wake showed plainly as a white streak. Six English cruisers were headed for the entrance in line-ahead formation. The armored cruiser *Inflexible*, with the flag of Admiral de Robeck, led the formation. Many light spots on the body of the ship told of the scars received in the Falklands battle. Behind her came the *Queen Elizabeth*, *Lord Nelson*, and *Agamemnor*. Then the *Majestic* and *Triumph*, showing distinctly the marks of their battles with the forts at Tsingtau. All tiptop ships of the British Navy. Albion's flag waves white in the wind.

Suddenly shrapnel clouds rose up around us. The French line ship *Bouvet* sent us up this greeting, but I, unfortunately, had to

refrain from answering. Our plane did not venture to carry any bombs. Then came a thrilling moment—a signal was sent out on the mast of the French flagship, "Raise anchor and follow the English." As the anchors were raised, the tricolor was slowly raised on all the ships and the topmast flags unfolded in the wind and announced the great day that was to seal our fate. Back now and report.

In all the batteries drums and horns summoned the men to the guns.

The dance began at 11 o'clock by a bombardment of gigantic strength. The heavy guns of the ships boomed unceasingly, mixed with the lighter clang of the medium and light artillery. Ten English and French line ships pressed together in the bay between Erenkoi and Tenker; 58 heavy rapid-fire guns against the 18 heavy guns of the fortress. The Turkish batteries from the outer wings where Wehrli was in command, up to the heart of the batteries, were hidden in a cloud of smoke, mist, and flying earth. At 2 o'clock in the afternoon de Robeck had commandeered all available ships. The thunders of the battle (up to that time the greatest that was fought between warships and land batteries) rose to gigantic power. Eighteen French and English ships were now engaged. Tschanak and Kilid Bahr began to burn. The Turkish works were quiet for a long time. All telephonic connections between them and our observation station were cut. Over Hamidie lay the smoke of the smoldering fires which had broken out in the barracks and tents. All around the walls and in the courtyard of the fortress there were gigantic craters made by the shells. All life seemed to have been destroyed.

Admiral Goubrette received orders to attack the inner works with his ships in order to crown the success of the day; English courtesy satisfying Gallic pride. Then, as the *Bouvet* and *Gaulois* came within firing range of Hamidie and Medjidie, white rings of powder rose out of the dark veil of smoke; the batteries answered with a well-directed fire, even though at slow intervals. The *Bouvet* was struck by Wossidlo. The columns caused by the detonation of the 35-centimeter shells rose to a gigantic height around the sides of the ship. Reeling, the ship turned on its side, capsized, and sank. After barely four minutes the waves of the Dardanelles had closed over its grave. Only a few of the crew were saved.

Soon after, the *Gaulois*, sinking with a bad hole in her bow, tried to reach the exit. The *Queen Elizabeth*, *Inflexible*, and *Lord Nelson* were often struck by Wehrli's 15-centimeter shells. These were only deck hits of slight caliber, but they greatly disturbed the fire control and command of the ship and in this way relieved the inner works.

One weapon had not yet been used. At that point where the ships during the past few weeks had been accustomed to take up their

position for the bombardment, the fort had laid some mines at dawn a few days previous unnoticed by the enemy. It is 4.15 p. m. The climax of the battle seems to have been passed on both sides. Then the English line ship *Irresistible* turned sharply to starboard and ceased firing. She appeared to have run on a mine and was lost. Torpedo boats and the line ship *Ocean* hurried to her aid in order to take off the crew. Wehrli's howitzers and the shells of Dardanos struck in between. Once again the battle began. Under the combined fire of many ships Hassan Mewsuf, the brave commander of Dardanos, fell. His battery was silent, smothered by the rain of shells. The village of Erenkoi was burning.

The *Ocean* now listed and flames broke out on the foremast of the *Inflexible*. Soon after the ships left the narrows. *Ocean* went slowly out with the current. The wreck of the *Irresistible* once more came into the range of Dardanos. The battery renewed fire, and again the *Triumph*, *Goliath*, *Vengeance*, and *Lord Nelson* took up the fight. Again the heights of Erenkoi were veiled in smoke. In the meantime, Fort Medjidie had again got some of its guns operating and, as night fell, slowly fired shell after shell against the *Irresistible*. Useless waste of ammunition. Our small searchlights tried indefatigably to order the battery to cease firing.

The noise of the battle was stilled. We rode into Hamidie by the light of the burning barracks. March 18, 1915, had become history. But the souvenir is alive, especially in the German Navy, members of which had fought shoulder to shoudler with their Turkish comrades, whose advisers and commanders they had been, and who had lived through the frightful attack together.

The commanders gave no thought to what was past. Admirals von Usedom and Merten and Gen. Djewad Pascha awaited the continuance of the battle the next morning and made their preparations accordingly. They could not quite grasp the significance of the day in its fullness. The did not know yet that the *Irresistible* and *Ocean* had been sunk and that the *Inflexible* and *Gaulois* were out of commission for several months. The exact damage to the forts was not yet known; but if, contrary to expectations, this damage should be slight, it was nevertheless impossible to replace the ammunition. Wossidlo reported only eight shells for each heavy gun. There were also no more mines to finish the blockade at Erenkoi. On the contrary we had to count on these mines being swept by the enemy, as we could not suppose that the English really would attribute their losses to floating mines alone, because they considered it impossible for us to lay mines there under their very eyes. The prospects for a new battle did not seem very favorable for us. Our military inferiority was plain; our only hope of

equilization lay in the admirable spirit of the men and the determination and discretion of their commanders.

If Admiral de Robeck had been a real plunger, then on the morning of the memorable 18th of March he would have attacked the fortress in quite another way. Blockade steamers ahead. Let them sink if they only succeeded in tearing holes in the inner blockade.

Then ahead with the fighting ships. Take the risk and fling out the shell—as many as the tubes can handle—in order to down Hamidie and Medjidie as quickly as possible. Through—the orderd should have been—through the narrows at Kilid Bahr and Tschanak at any price. Catch the batteries in the neck and roll out one fortress after another.

Gen. Sir Ian Hamilton waited on Lemnos with 25,000 men. In the same night these men could have been landed near Tschanak and Kilid Bahar. Their number was sufficient to overcome the weak infantry of the fort. Then De Robeck, without any danger to himself, could have bombarded the forts of the Bosphorns from the Bay of Therapia and could have joined Russia's forces.

Did De Robeck not have sufficient nerve to do this? Did instructions from London prevent him? Nevertheless, in spite of the failure of March 18, he still had the intention of renewing the attack. He knew the lack of ammunition. He cabled London in this regard.

Sir Ian Hamilton warned, however, against a renewed risk of the fleet, and the English sea loards view any new naval losses as a shattering of Albion's naval supremacy. The losses robbed them of cold-bloodedness and decision. They decided for an abandonment of the one-sided naval operation in favor of a combined land and naval operation.

This transferred the weight of the struggle to land. The decision now lay with the Turkish troops. I have no space here to do credit to their success. I must limit myself to stating briefly the events in which forts and navy took part.

On April 25, 1915, the enemy landed at Gallipoli. French and English troops were landed at Kum Kali, Seddul Bahr, and Ari Burnu-Kaba under the yrotection of line ships. Sir Ian Hamilton started a fake attack in the Gulf of Saros in order to tie up the Turkish forces, but Marshal Liman von Sanders quickly took in the general situation and was not deceived by these tactics; he threw all available troops on the Ari Burnu front. If the enemy broke through there, then he could get through the broad valley of Maidos andreach Tschanak in the rear. The the fortress was lost.

We at Hamidit, helplessly watched the events at Kum Kali and Seddul Bahr. We could not see what was happening at Ari Burnu.

Only Wehrli was able to reach Seddul Bahr with a few 12-centimeter guns at In-Tepe and thus hinder the landing at this point.

In order to reach the French trenches near Kerewisdere and the landing place near Teke Burnu, and in the Morto Bight, Admiral von Usedom had old 24-centimeter cannons of the fortress and 15-centimeter rapid-fire guns of the *Goeben* and other Turkish ships set up in In-Tepe during the weeks following the landing of the troops. Light rapid-fire naval guns were hurriedly put on portable gun carriages in order to be used as soon as possible in In-Tepe. English reports continued to announce how disagreeable this flank fire was.

In order to support and assist the Turkish troops at Ari Burnu, the line ships *Torgud Reis* and *Barbarossa* directed fire from the heights of Kodjalschemen Dagh, in accordance with a plan worked out by German naval officers. They had to continue moving in order to avoid submarines and to avoid the indirect fire of the *Queen Elizabeth*. It was a peculiar feeling to see the gigantic columns of water (caused by the English 38-centimeter shells) rising all around the ship with no sight of the enemy. In the August days of 1915 the *Barbarossa* fell the victim to a submarine attack.

In the dark of night the torpedo boat *Muavenet*, under the command of Captain Firbe, went as far as Seddul Bahr and sank the line ship *Goliath*, whose task it was to fire on the flank of the Turkish Army.

Naval officers watched across the sea from the bombarded observation stand in Jene Schehir; their reports regarding the enemy's movements guided the actions of the German submarines. At the beginning of May, 1915, Captain Hersing was the first to appear at the Dardanelles, with the *U–21*. Long, difficult weeks lay behind him and his crew. This long trip to the Mediterranean demonstrated the utility of German submarines far from a native base and opened the era of success of our submarines in the Mediterranean.

The first of the large warships to fall a victim to the submarine was the English line ship *Triumph*. It lay behind its nets, and with a feeling of perfect safety fired on the Turkish positions at Ari Burnu. Here Hersing's torpedo caught it. A few days later the *Majestic* met a similar fate, as it lay at anchor near Seddul Bahr among a number of steamers; it was fired on by the *U–21* through a narrow opening between two transports. These losses forced de Robeck to withdraw his large ships to Mudros and Imrros, a very great relief for the Turkish ships.

Along with the *U–21*, small German submarines from Pola also appeared at the Dardanelles. They sank many steamers bringing troops and material to Gallipoli. Small German freight submarines brought machine guns and fuses to Constantinople in spite of English net blockades.

On January 10, 1916, the Dardanelles campaign ended at Gallipoli with a Turkish victory.. The main service and the happy outcome were due to Marshal Liman and his troops. However, we can state with pride and statisfaction that without the victory of the naval forces Liman would never have had an opportunity to demonstrate his ability. Without the threat imposed by our submarines, the fire of the English line ships would have still been able to weaken the resistance of the Turkish soldier. Our submarines did their part under the most difficult circumstances and brought about the ultimate victory.

The fortress as well as the ships of the Turkish Navy also gave their best in order to relieve Liman's sorely tried troops; they also played their part in the great success.

After the retreat of the English and the French, the fortress was not again engaged in any extensive military action. Quiet again reigned. The mine blockade laid in 1914 could now be removed and replaced by a new one, a difficult and dangerous work in which many members of the navy and the fortress lost their lives, for at that time, owing to conditions, the mines were laid without any connecting lines; they therefore could not be removed by raising the line, but had to be hunted out as in the case of enemy mines. In laying the new mines, the statistics regarding the ocean bottom and currents, which were issued by Professor Merz, of the Berlin "Institute Für Meereskunde," as a result of his hydrographic investigations and studies of the Narrows at this time were of great value.

New guns were installed on the coast and were well protected and hidden; they had many engagements with enemy monitors. The airplanes of the fortress also were engaged in action after the end of the battles. Among their pilots, Lieutenants Liebmann, Langfeldt, and Lieutenant Commander Goltz repeatedly attacked the English bases at Lemnos and Tenedos. Our seaplanes had strong protection in the German military flyers, the most successful of whom was Captain Buddecke ("el Schahin"), the falcon, as he was called.

The fortress was not now so defenseless as it was in March, 1915. Time and communication with Germany had made it possible to increase its military power and strength so that even the most daring and reckless attack against it must end in failure. Nevertheless, so influential as was the success in the Dardanelles on the events of the first year of the war, just so quickly did its significance decrease as, after Russia's collapse, the interests of the western powers in the immediate possession of the Narrows diminished as the general interest in the events on the other battle fronts increased.

At the end of October, 1918, the special naval command had left Turkey.

The remembrance of the Turkish companionship in arms and the conviction that self-confidence, efficiency, and bravery are the powers which bring success even when material aids are slight are very keen in all of us who lived through the times just described. The correctness of this conviction has been demonstrated anew by Turkey in the political and military successes attained since the war, in spite of the unfavorable conditions existing. They have shown us what difficulties can be overcome by national pride and daring action under the confident leadership of one man. It is the spirit which conquers. This spirit must be reawakened in our people.

SPAIN

CARRIER "DEDALO"

May, 1924

The Spanish airplane carrier *Dedalo* is now undergoing extensive repairs, but it is reported by reliable authority that they are having so much trouble with the machinery installation that it is doubtful if she will ever be in first-class running condition.

The following information on this ship is taken from a report of inspection dated May 8, 1923.

The *Dedalo* is an ex-German merchant ship interned during the war. It was converted into an aircraft carrier in 1922. The *Dedalo* was originally built in 1901. It has a displacement of 5,625 tons, a length of 420 feet, a beam of 55 feet, and a draft of 21 feet. At the time of my visit to the *Dedalo* there were no seaplanes on board, the only aircraft being two S. C. A. airships (53,660 cubic feet capacity), one inflated and the second one disassembled. These airships are 129 feet long, 28 feet in diameter, and 46 feet high. A well has been made in the forward hold and comfortably accommodates one such airship. The top of the well is covered by a tarpaulin and the floor is of cement. On the port side of the forward hold is a ferrosilicon hydrogen generating apparatus and a compressor. By these means 176,000 cubic feet of hydrogen can be stored in tubes.

In the nose of the *Dedalo* is the airship mooring mast, about 90 feet high. Moving up and down this mast is a triangular distance piece 15 feet long, equipped with a buffer at the end, inflated to the pressure in the envelope of the airship. About 150 airship ascents and moorings have been made, generally with the *Dedalo* proceeding at about 10 knots. At the beginning of the operation of ascent, both airship and ship face the wind. The airship is then slowly raised to the level of the masthead by releasing ballast. The *Dedalo* is then turned into a position 90° to the wind, leaving the airship still with its nose in the wind. The connecting line is then released and the airship gets away.

In coming for a mooring the airship heads into the wind, while the *Dedalo* proceeds with the wind 45° off the bow. When over the ship, at a height of about 200 feet, the airship drops a line to the ship. This line is connected to the main mooring line running up the mast. The *Dedalo* then swings into line with

the wind and the airship slowly descends and noses up against the distance piece of the mast.

The rear of the *Dedalo* is designed to carry heavier-than-air craft. The deck is sufficiently long to allow airplanes to take off, but not to allow them to land. Most of the craft carried, however, are seaplanes, which are lowered to the water by cranes. About 20 seaplanes can be accommodated on three decks, access to which is obtained by an elevator almost the full width of the ship. Part of the deck, immediately under the platform, is fitted up as the workshop and contains two engine test beds, one with a Froude brake for large engines such as the Napier "Lion" and one for smaller engines.

The *Dedalo* has a special funnel to prevent the escape of sparks. At the point near the top, where the section is enlarged, there is a metal disk equal in diameter to the width of the lower part of the funnel. Between this disk and the outer wall there is an annular space equal in area to the area of the lower part of the funnel. In case any sparks should not be stopped by this disk, there is a wire mesh above it.

OFFICE OF NAVAL INTELLIGENCE
NAVY DEPARTMENT
Washington, D. C.

MONTHLY INFORMATION BULLETIN

NUMBER 7—1924

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In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines

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1924

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OFFICE OF NAVAL INTELLIGENCE

MONTHLY INFORMATION BULLETIN

NUMBER 7—1924—JULY, 1924

FOR CONVENIENCE IN ROUTING

Officer	Initials	Date received	Date forwarded
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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JAPANESE DESTROYER DIVISION NO. 5 ("KAZE" CLASS) WITH LIGHT CRUISER "KITAKAMI" AT ANCHOR OFF HANKOW

GREAT BRITAIN

AIRSHIP DEVELOPMENT

June, 1924

It is understood that the Air Ministry, immediately upon approval of the budget containing the supplementary estimate for airships, will form an airship department which will be entirely separate from organizations in the Air Ministry. The airship department will be directed by an officer designated as "director of airships," who has yet to be selected. It is rumored that General Masterman, a former lighter-than-air official, is a candidate for this post, but is unlikely to be appointed. Lieut. Col. E. C. Richmond, now handling material specifications and chemical matters in the technical department of the Air Ministry, will be in charge of the design division under the director of airships and will have to assist him such technical personnel as the Air Ministry will detail. This will include Mr. Evans, late R. C. N. C., and Doctor Southworth, a structural expert from the National Physical Laboratory at Teddington, in addition to Doctor Peppard, who will be retained for structural-design work, and Professor Bairstow, consultant on aerodynamic problems. Major Scott, formerly commanding officer of *R–34*, will be in charge of the flight section and will have charge of all flight trials and flight experiments. Major Scott is now employed in a civilian capacity by the Air Ministry and is stationed at Pulham, in charge of the station there. He will continue in a civilian capacity and is now collecting a crew of former airship officers who are to be retained in a civilian capacity to operate the airship *R–33*.

The plan is to recondition the engines of the *R–33* and fit a new outer cover. A set of gas bags from *R–36* has been examined in store and found to be apparently in good condition. *R–33* will be inflated at Bedford, and if the gas bags are found to be fairly satisfactory experimental flights will be undertaken in about three months' time.

It is planned to fit pressure tabs to the number of 200 at different points on the surface of the ship and on the fins. Flights will be made to determine pressure distribution while maneuvering and while lying at the mooring mast. There is already a mooring mast

at Pulham for this purpose. *R–33* will be moved from Bedford to Pulham, and these two stations will be put in operating condition. If any difficulty is had with *R–33*, *R–36* may be taken for these trials. It is understood that Colonel Richmond will undertake static bending tests of an airship in a shed in order to obtain further light on the theory of the rigid airship structure.

The former air station at Howden has been sold, but has not been dismantled by the purchasers, and it is understood that Commander Burney, or Messrs. Vickers, as his backers, have now purchased it. The proposed contract with Burney or the Airship Guarantee Co. provides only for the construction of this ship. It will be noted that the price to be paid is £300,000 plus a £50,000 contribution to capital charges. Assuming the ship costs £350,000 and is of 5,000,000 cubic feet capacity, this works out to a cost of about 30 cents per cubic foot, which seems to be low. It is said that Commander Burney struggled hard to get a higher price allowed him, but was unable to obtain a better figure from the Air Ministry. However, it is understood that the Air Ministry, without permitting anything to show in the estimates at this time, will pay the Airship Guarantee Co. an additional sum of money in consideration of their putting the air station at Howden in an operating condition and giving the Air Ministry the right to take it over in a national emergency. This virtually amounts to a subsidy toward Burney's plant expenses. It has been learned that the cost of the *R–34* was 50 cents per cubic foot and the cost of her sister ship, *R–33*, was $1 per cubic foot, the difference being explained by the amount of pioneer work done by Armstrong's on *R–33*, which Beardmore's were able to take advantage of in building *R–34*. The Burney airship will bear no charge for experimental development and research, it being understood that all experimental work of a fundamental character necessary to afford design data will be carried by the Air Ministry.

The design work of the Airship Guarantee Co. is understood to be handled by Mr. Wallace, former chief draftsman of Vickers (Ltd.), and it is likely that Mr. Pratt, also of Vickers, will be associated with Burney. Burney has already retained Maj. P. L. Teed, hydrogen expert and chemist, and Commander Isherwood, mechanical engineer.

In conversation it has been learned that the principal features of the design have, of course, not been determined, but at the present time the Burney group, under Vickers influence, were inclined to build their ship of duralumin, while the Air Ministry experts were inclined to use strip steel. Recent experiments have indicated that for a ship of 5,000,000 cubic feet and large diameter the Zeppelin type girder can not be made satisfactorily and that a new type of

girder must be developed. The recent British work with steel spars for aircraft, using curved and corrugated sections, has been very promising, and an attempt will be made to develop a steel girder, making use of fundamental data acquired in connection with steel airplane construction. It is also understood that the British designers are of the opinion that the wiring system used in Zeppelin airships is inadequate for ships of greater size and that a new system will be proposed by them which, it is hoped, will entirely relieve the longitudinal girder of the transverse pressure due to gas-bag lift. The nature of this new wire bracing is naturally not disclosed.

It is further understood that the British designers feel themselves in a position to proceed with confidence and that they have no desire or necessity to obtain German assistance, even should such assistance be offered to them for a reasonable price. Colonel Richmond takes the view that the German knowledge and experience is entirely based upon ships of relatively small sizes, and that any conclusions reached from that experience must be false when applied to ships of 5,000,000 cubic feet, as contemplated by the British Government at this time.

Inquiry at the Admiralty indicates considerable interest in the development of rigid airships for possible use with and for the fleet. It is understood that the airship to be built by the Air Ministry will be designed with a view to operations with the Admiralty and that the Burney airship will be a commercial type designed to be used between England and India by way of Egypt. The Admiralty seem to have no great confidence in the ability of the designers which the Air Ministry will use, but admit that they are not in a position to handle the matter themselves. It is understood the director of naval construction has had a proposition put up to him to take over the job of designing a rigid airship in his own organization, but has refused to agree that this would be good policy, and will make no objection to the present course of events.

Rigid airships will of necessity use hydrogen gas for buoyancy, and in view of the fire risk the Air Ministry officials are determined to develop either a kerosene or heavy oil engine, preferably the latter, eventually. It is understood that Beardmore's have been working on this problem for some time, but are not yet in a position to guarantee the 600-horsepower unit which the new airships will require. It is intimated that the Air Ministry will select a firm for the development of engines for both airships. In view of Beardmore's present work on this problem, it is likely they will be chosen for this work. It is noted in this connection that the Airship Guarantee Co. will not bear the expenses of engine development, and may possibly have engines supplied them by the Air Ministry. It is considered by

those best informed that it is likely that the first engines will use kerosene, to be replaced later when a new heavy oil engine has been thoroughly developed. It is claimed by a Beardmore employee that their 6-cylinder oil engine is designed for 600 brake horsepower on ordinary Diesel engine oil and 800 horsepower (with different cylinder blocks and details) on gasoline. It is understood trials of the engine on oil have been run at 400 horsepower.

Research will be undertaken on the development of a new type of gas cell, but in the meantime the Air Ministry experts are convinced that the British practice of sticking goldbeater's skin to a rubberized fabric is unsatisfactory and will not be used. Experiments with samples of gas-cell fabric made by the British and by the German systems have been made in Egypt and the conclusion reached that the British material has a very much shorter life. It is also believed that varnishing the skins on the inside is advisable.

GREAT BRITAIN

BURNEY AIRSHIP SCHEME

June, 1924

The plan for building airships, known as the Burney airship scheme, which provided for a government subsidized commercial airship line with biweekly service to India via Egypt, with a projected extension of the service to Australia, was rejected by the Labor Government, and a scheme substituted whereby the Government will build one airship, and will contract with the Airship Guarantee Co. (Burney Co.) for another. The Air Ministry is to provide the necessary ground facilities in England and India, and at intermediate stations along the route, for the operation of airships of 5,000,000 cubic feet capacity. The Airship Guarantee Co. is to have the option of repurchasing the airship built by them for the Government at one-half the contract price in event of their requiring it for the operation of an approved commercial airship service. The ship to be built by the Burney interests is to be designed for commercial purposes; the one to be built by the Air Ministry will be designed with regard to service requirements, including naval reconnaissance.

Before proceeding with the design of these ships, one of the existing ships, probably the *R–33*, will be reconditioned for conducting experiments and research. The Secretary of State for Air said in the parliamentary debates of May 21, 1924, "that he hoped to have two airships in the air in three years' time."

The terms of the Government contract with the Airship Guarantee Co. gives the following information:

(1) Gas capacity not to be less than 5,000,000 cubic feet. (About twice the size of the *ZR–1*.)

(2) A speed of not less than 70 miles an hour at 5,000 feet altitude to be attained on flight trials.

(3) Total fixed weights not to exceed 90 tons.

(4) Navigability to be possible within certain specified angles of pitch.

(5) The ship to comply with general requirements for air worthiness.

(6) Cost £300,000 plus £50,000 contribution to the contractor's capital expenditure.

(7) Among other tests, a voyage to India.

The question as to the exact position of the relations between the Admiralty and Air Ministry in regard to airship development is still unsettled and will be referred to the committee of imperial defense for decision.

It is interesting to note the description of a 5,000,000-cubic-foot airship as given in Commander Burney's paper read before the Third Air Conference, in February, 1923. Although these characteristics may not coincide with the present projected ship, Commander Burney is the leading figure in the Airship Guarantee Co., which has the contract to build the present ship of 5,000,000 cubic feet.

Length, 760 feet; diameter, 110 feet. "Allowing a disposable lift of only 50 per cent so as to make adequate provision for the increased ruggedness of construction desirable for commercial work and assuming a flight of 3,000 miles as the average length of a commercial flight without refueling, it would, allowing for contrary winds, give 44.5 tons for the carrying of mails, passengers, etc., at a speed of 80 miles per hour. If 375 pounds is allowed for each passenger, the capacity of the ship will be 207 passengers and 10 tons of mail and other freight."

In discussing the original Burney scheme before the House of Commons, March 11, 1924, Sir Samuel Hoare, ex-Secretary of State for Air said:

> If the scheme proved successful, it would be possible to reach Cairo, not from 5 to 8 days, but in 2 days. It would be possible to reach Bombay, not in 14½ days, but in 4½ days. It would be possible to reach Singapore, not in 28 days, but in 8 days. It would be possible to reach Perth, supposing the service was extended, as it was intended, to Australia, not in 28 days, but in 11 days.

Lord Thomson, the present Secretary of State for Air said in the Parliamentary Debates of 21 May, 1924:

> I think there are several other people wanting to buy airships already at the present time, other countries and other private institutions.

GREAT BRITAIN

DETAILS OF NEW BATTLESHIPS

June, 1924

It is confirmed that the main armament of the *Nelson* and *Rodney* is disposed in three triple turrets forward of the conning tower, giving bow fire of 6 guns, broadside of 9, and no stern fire.

The secondary armament consists of either twelve or sixteen 6-inch guns mounted in pairs in light closed turrets. The two guns in the turret elevate independently if desired. The shell hoist is understood to be a direct hoist to the handling room under the turret. The powder in a single bag per charge is believed to be delivered to the turret handling room by a two-stage hoist system. The powder hoist of each stage consists of a cast bronze sectional tube with bolted flanges. An endless chain runs up one tube and down the other, carrying the powder bags. At the joints or sections of the tube there are antiflame flaps which are automatically turned back to permit the powder charge to pass and then are locked across the tube.

It is understood, but can not yet be confirmed, that the boilers of the *Nelson* and *Rodney* will be six each, of the Yarrow type, giving a rated power of 40,000. This would indicate a speed of only 21 knots, which is consistent with the rumor that abnormally heavy protection is provided.

JAPAN

COMPARATIVE LABOR COSTS IN JAPAN AND AMERICA, WITH SPECIAL REFERENCE TO JAPAN

The following information, which is furnished by a leading American construction firm engaged in work in Japan, is of considerable interest in showing the efficiency and inefficiency of Japanese labor:

Laborers.—United States, 0.90 sen per hour; efficiency, 100 per cent. Japan, 0.32½ sen per hour; efficiency, 20 to 33½ per cent.

Work includes mixing and placing concrete, helping mechanics, handling materials, cutting for various trades, and general labor work. This applies to a building under construction on which 2,000 men are employed, where they will be working on approximately eight floors and in numerous rooms where it is impossible to keep constant watch on every man except at intervals of about two hours during the day. On an open excavation where all of the men are under constant observation, the percentage of efficiency will increase from 33½ per cent to 45 per cent. Foreign supervision will be re-

quired to obtain these results, as the Japanese foremen are indifferent to the loafing indulged in by the men.

The above percentages of efficiency are produced in spite of the fact that the Japanese laborers are provided with the same type of tools, appliances, and equipment as the American laborers. The low percentages of efficiency of the Japanese laborers are due to the following conditions:

(1) Engaged each morning and paid off at night. Only approximately 10 per cent of the men will return for work the following day.

(2) Utter disregard of responsibility to accomplish a fair day's work. Considered to be very clever in evading employment when supervision is absent.

(3) Undernourished. Inadequate food as regards quality and quantity. Do not hold any money in reserve, but spend all of their day's earnings every night. In the event of unemployment the following day, they will not have any food other than that provided by the labor boss.

(4) Of a day's wages of yen 2.80 paid to the labor boss, the men receive from yen 1.25 to yen 1.80. The laborers are aware that the labor boss receives yen 2.80 for the services of the men, but are afraid to object owing to the bond existing between them. This condition creates a feeling of indifference among the men, and reduces them to a point of evading actual work as much as possible. The men resort to tricks and practices of every description to make it appear that they are attending to their work. For instance, a man drilling holes in a concrete wall or ceiling will swing his hammer but will not strike the drill. If he does so, the force applied will not be sufficient to accomplish any work. As soon as he discovers that he is under direct observation he will begin to strike harder.

Carpenters.—United States, yen 2 per hour; Japan, yen. 0.45 per hour.

On Japanese dwelling houses, on which styles and methods have not changed during a number of years, the men do a fair day's work. On this class of construction their efficiency is approximately 50 per cent of an American carpenter. On general wood framing, as house work similar to American construction, working on a small building 17 by 26 feet, which was detailed very carefully and completely, it required 33 men days to make and set the wood forms for the concrete foundation, cut and install the sills and floor joints, and cut and erect the frame for one side and two ends. On a building 26 by 34 feet, erected at Los Angeles, this portion of the work, including the additional amount due to increased size, was accom-

plished by two carpenters in four days, or 8 men days. The proportionate cost will be as follows:

Japan, 33 men, at $1.80, $59.40.

United States, 8 men at $8, $64.

Assuming the American job to be 100 per cent larger in size and with due consideration to the fact that this does not necessarily mean twice the labor, it is fair to assume that the American job would take the Japanese carpenters fully 30 per cent longer to complete. This increases their net labor cost to $79.20.

The percentage of efficiency in this particular instance of a Japanese carpenter in comparison with an American mechanic was 181⅝ per cent. The increased cost for using Japanese carpenters in comparison with American mechanics was approximately 24 per cent.

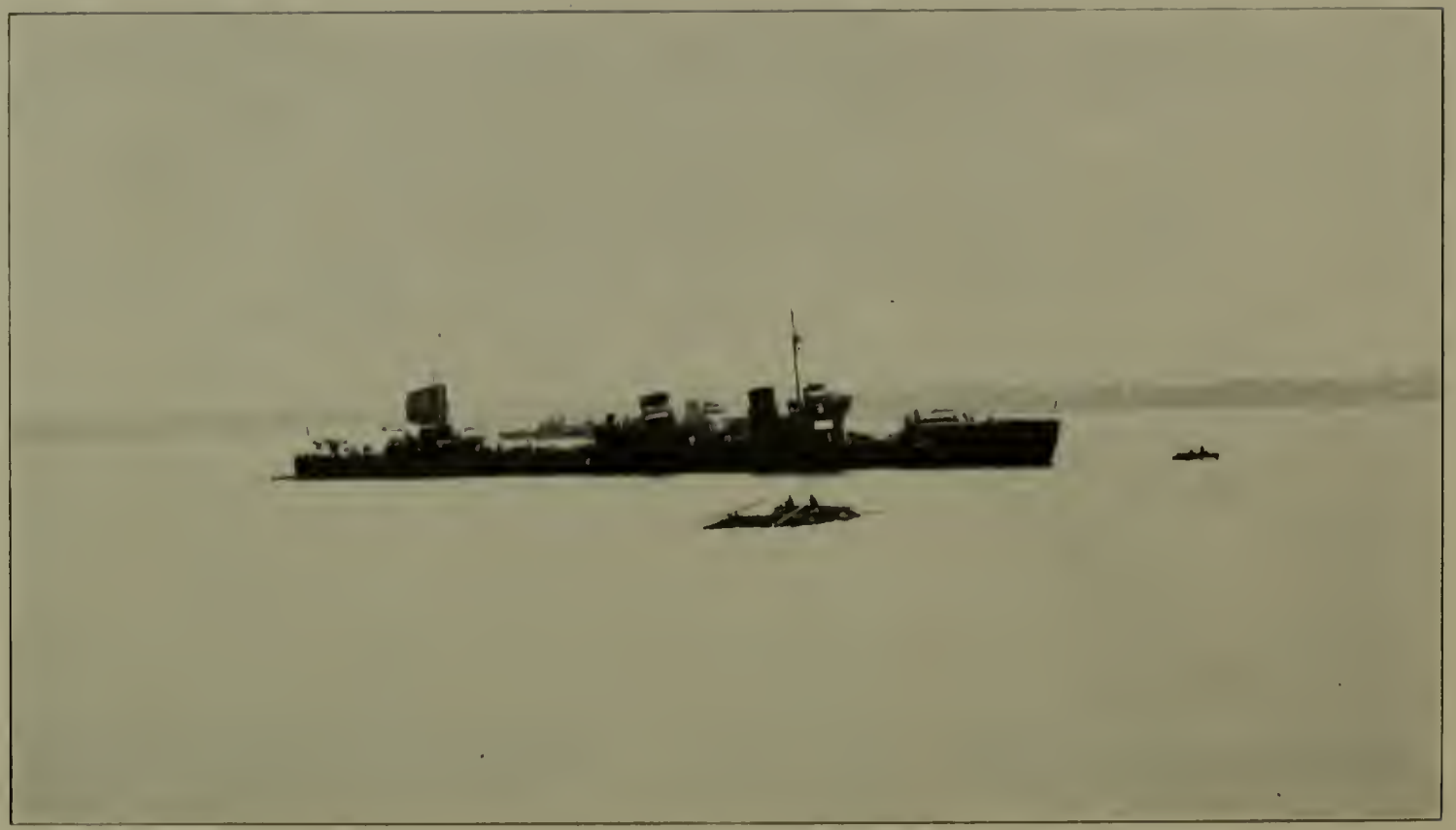
On fireproofing office construction, the labor cost for carpenters per unit of work is slightly higher than prices for New York labor. It is usual, therefore, in estimating cost for labor, to use New York prices.

Japanese bricklayers paid $12 per day will lay from 800 to 1,000 brick per day. Considering quality and quantity, it is usual to estimate labor cost for handling and laying brick on the basis of New York practice.

Japanese labor cost for three-coat plastering work will be $0.63 per square yard. Labor cost on two-coat cement stucco work will be $0.54 per square yard. This is based on a daily wage rate of $2.25 per eight hours.

For work of a similar quality the American labor cost for three-coat plaster work will be about $0.50 per square yard, and for two-coat stucco, about $0.40 per square yard. This is based on wages of $10 per day of eight hours.

It appears to be impossible to obtain work equal in quality to the general American practice in any of the trades as carpenter work, bricklaying, plastering, terrazzo work, tile or mosaic, marble, ornamental iron and bronze, or any of the building trades generally. The men, as a body, resent the introduction of any short cuts or improved methods of operation. A case in point occurred in connection with the disposal of earth excavated from buildings. This has to be removed by boats, and the usual procedure was to haul the material from the building site in small handcarts, which were taken to the banks of the canal and dumped. The boatmen then shoveled it into a litter and carried it across a plank to the boat. We endeavored to induce them to dump directly from the handcarts into the boats so as to save the extra handling, and even designed and offered to install wood chutes, but they would not adopt our methods. After a full year of demonstrating that they were wasting money they



JAPANESE DESTROYER NO. 5. ONE OF THE NEW CLASS OF 1,400 TONS. OF WHICH 28 ARE BUILDING. FOUR 4.7 INCH 40 CALIBER ON CENTERLINE. TWO MACHINE GUNS; 3 TWIN 21 INCH TUBES. SPEED 34 KNOTS HORSEPOWER, 39,000; FITTED TO CARRY MINES

were prevailed upon finally to try out the scheme. The result is that at the present time chutes are used almost exclusively. The general result is that the Japanese buildings in course of construction have plenty of hoisting equipment, derricks, and suspended scaffolds, whereas a year ago all materials were moved by hand, and inclined runways were used to get materials from floor to floor.

JAPAN

MISCELLANEOUS NAVAL NOTES

May–June, 1924

[From Japanese press]

The Second Submarine Flotilla, which is now composed of the Fourteenth Division, consisting of submarines *Nos. 45, 58,* and *62,* and the Twenty-sixth Division, consisting of submarines *Nos. 59, 68,* and *72,* will be supplemented from August, 1924, with the Seventeenth Division, consisting of submarines *Nos. 44* and *51,* and at the same time the *Karasaki,* now acting as tender, will be replaced by the *Chogei,* which is now being equipped at Nagasaki.

The flotilla will participate in the grand maneuvers in its new formation.

On June 5, one of the men under training, while attempting to land, collided with another plane which was getting ready to make an ascent, with the result that both planes were completely demolished, but the men escaped with slight injuries.

The accident was due, it is said, to a heavy fog prevailing.

The accident occurred at Kasumigaura.

One officer and three men were killed and another man seriously injured when aircraft *No. 58,* of the F–5 type, fell from a height of 200 meters, at Yokosuka.

The cause of the accident is reported as due to a sudden whirlwind, which often occur in the vicinity of the aviation corps grounds.

The order issued by the Naval Minister as the result of the naval conference on May 28, strictly prohibiting the equality movement of the engineering naval officers, has brought about a rather unexpected result, all the engineering officers getting so angry that they are declaring they will appeal to the public.

This problem has been afoot for the past 10 years, before it was presented to the naval conference for a decision, through Engineering Lieutenant General Hiratsuka, the only engineering officer present at the conference, when Fleet Admiral Togo and Vice Admiral Ide, ex-Vice Minister of the Navy, vehemently opposed the movement for the reason that the command of a ship must always be in the hands of a regular naval officer.

In this respect, a certain engineering naval officer is reported as follows: "The equality movement originated in two principal points. The first is that in our Navy, the commanding power is monopolized by the regular naval officers irrespective of rank. When the captain of a ship becomes unable to take command the power goes to the subcaptain; if the subcaptain is also unable to hold command, it goes to a lieutenant commander, and so it goes down to a mere sublieutenant, and never comes to an engineering officer, though he may be of the same rank as the captain himself. This is a very discriminative treatment quite inconsistent with the spirit of the times. The second is that the naval cadet's school has a preference over the naval engineering school in taking as many students as are wanted from the candidates of those two schools, and only when the number of the candidates is in excess of the students wanted, the naval engineering college is allowed to take them in. We want to abolish these unreasonable discriminations."

The two naval planes which left Omura on May 17 (6 a. m.) arrived and landed at Kasumigaura at 4.10 p. m.

The machines stopped at Hiroshima and Akeno-ga-hara to refuel. The distance covered is 600 nautical miles; actual flying time, 5 hours and 30 minutes.

They will leave Kasumigaura on the 18th or 19th, returning to Omura over the same route, without stopping.

The cruiser *Tsugaru* is to be subjected to bombing by two planes from Oppama followed by bombing machines from the airplane carrier *Hosho*, off Yokosuka on May 27. Bombs are to be dropped from a height of 1,000 meters. After the bombing by the airplanes the men of the torpedo school will fire torpedoes at the condemned ship until she is sunk.

On May 30, one of the men under training at Kasumigaura was engaged in carrying out a reconnaissance flight in an Avro scout machine when suddenly the machine, at a height of 2,000 meters,

with a loud explosion, burst into flame and fell into the lake. The cause of the accident was believed to be due to the explosion of the gasoline tank and to carelessness in assembling the machine.

Submarine *No. 44* (1,500 tons), which was under equipment at Kure, and which was to have been completed in March of last year but was delayed on account of lack of materials, has finally been completed, and on June 16, 1924, the ceremony of hoisting the flag and of turning over to the commanding officer will take place. She is of Japanese own special design.

The *Asahi*, attached to the Yokosuka Naval Station, while proceeding to Toba hit a reef near Hikose, about a mile and a half east of Tsukiagezaki, near Toba-ko, on May 28. It being high tide, she was refloated after being on the reef about half an hour.

It was at first believed that the *Asahi* had sustained no damage, and she anchored off Toga harbor. Later it was found that she was leaking badly and she listed to one side. During the night the pumps were kept working and the *Aso* stood by to be ready in case of emergency. The condition of the *Asahi* was reported to Yokosuka and assistance asked for, to which they replied that a destroyer with the necessary equipment and men would be sent.

An examination of the bottom of the *Asahi* showed that several small rents were made on the starboard side, the Kingston valve in the engine room was found badly damaged, through which the water leaked into the coal bunkers and the water tanks. At first the water leaked in at the rate of about 600 tons per hour, but later this was reduced to 300 tons. Her engines failed to work.

The destroyer *Shiokaze* arrived on the night of the 29th, bringing the assistance asked for, and work on repairing the leaks was started, which is expected to be finished by the 31st. The *Asahi* being unable to proceed under her own steam, she will be towed to Yokosuka.

The *Hayatomo*, which was built at Kure, was turned over to the Navy on May 18. She will go to Sasebo on May 22, leaving there on May 28 for her maiden trip to San Pedro to load oil.

On May 16, 1924, while submarine *No. 45* was maneuvering to attack the *Hirato* in Hiroshima-wan, something went wrong in her engine rooms; she listed to port and sank to a depth of 170 feet.

After strenuous efforts on the part of the crew the submarine was again brought to the surface and proceeded to Kure, where experts are trying to find out what was the matter.

A meeting of high ranking Navy officers, including Gensuis, chief of general staff, members of war council, commanders in chief of naval stations, Vice Minister of the Navy, and others was held in the Navy Department on May 28, changes in naval regulations being discussed.

The most important question discussed was the treatment of engineer officers on the same basis as line officers. As the regulations now stand, engineer officers can not be promoted above vice admiral, and this is considered to be unfair. It was proposed to change the regulations covering entrance to engineering school so as to admit graduates from the naval academy who are either ensigns or lieutenants, junior grade, same as is the case with the torpedo and gunnery schools, which would permit them to be promoted to the grade of admiral.

This has been a question of long standing, having first been mentioned 15 years ago, but did not come to official consideration until Admiral Takarabe became Minister of the Navy, who referred the matter to the investigation board of the naval educational system. Both sides having taken a firm stand, agreement was impossible. Arguments have been advanced by both sides, but a decision could not be made, and it was closed with the understanding that the matter be further studied, perhaps leaving the last decision in the hands of the minister.

The following statement was made by the new Minister of Marine:

"I recently visited Kure and Bako in the capacity of extraordinary inspector, and was pleased to find the spirit of the Navy among the officers and men had not slackened.

"The national-defense program of Japan has never been based on aggressiveness but has been a policy of defensive—it is like a coat of mail. However, this coat of mail has been made defective in certain places and must be mended.

"Of late, accidents to submarines and airplanes have occurred frequently. It strikes us as being rather alarming, but the average for the past 10 or 15 years is not greater than the average of other countries."

When one of the reporters asked him if the finances of the country permitted it would he go back to the old schedule in carrying out the noncapital ship construction program, he intimated that he thinks that should be done if the finances permitted it.

JAPAN

REACTION TO U. S. IMMIGRATION BILL

June, 1924

It is generally thought that the outbreak of anti-American feeling is gradually subsiding and that the matter will soon be forgotten by the public, which took the occasion to lift the safety valve and let go some excess steam. It is believed that the student element of Japan is responsible for such demonstrations as took place and that this particular class of the Japanese public, on account of a restless state of the mind, embraced the opportunity of venting their feelings.

The serious thinking men of Japan, feeling a wound to Japanese pride and prestige, while not voicing their sentiments so loudly, are nevertheless sorely disappointed in the passage of the immigration bill, and the interesting phase of the situation remains as to what effect time will have on their emotions.

It is believed that the military class was exercised by the situation to such an extent that had the resources of the two countries been more nearly equal, armed conflict would have been hard to avoid. Rumors are now current to the effect that Japan is biding her time; and while nothing definite has been learned to substantiate such rumors, it is felt that the matter bears very close watching. In the way of unusual naval activities, information from a reliable source has been obtained that the Asano Bussan Co. has asked the Sinclair Co. to try to arrange a contract for the Asano Co. with the Russians for the sale of 18,000 tons of fuel oil per month from September next; that this is wanted for the Japanese Navy very urgently, and that the Japanese are, for some reason, unable to arrange directly with the Russians for this sale, but believe they can do so through the good offices of the Sinclair Co., who have Russian oil concessions in the Batum district which are now being worked pending the decision of the Sinclair Co. as to supplying certain funds which the Russians have demanded.

It may be that the Japanese are unable to obtain this oil from the Russians directly because of an effort on the part of the Russians to use this need of Japan as a means of getting better terms in the negotiations now pending at Peking.

ITALY

APPOINTMENT, PROMOTION, AND RETIREMENT OF AIR SERVICE OFFICERS

June, 1924

COMMISSIONED OFFICERS

The Italian air service has the following corps of officers, the officers of each corps being commissioned therein:

a. Corps of officers under headquarters military air service. These are officers on duty with or available for duty with the flying units. They correspond to and will be referred to in this report as line officers. They form the great majority of air service officers.

b. Corps of officers belonging to the aeronautical engineering and construction corps. Under the intendant general.

c. Corps of officers belonging to the aeronautical commissariat corps. They perform administrative functions in the various offices subordinate to the intendant general.

d. Corps of airport officers.

This report refers especially to the officers of *a* and *d* above.

The commissariat for aviation has recognized the necessity of adopting a system for the advancing and retirement of air service officers different from that in force in the Army and Navy and has set forth the reasons therefor as follows:

The career of line officers of the air service is substantially different from that of all other careers on account of the greater attendant professional risks, of the gradual but constant declining of the psychophysiological qualities required for flying, and of the statutory principle of compulsory flight extended to all ranks.

Unlike the careers in the Army and Navy it is necessary to foresee that a great number of officers of the air service will be released from active flying service on account of unfitness for flying and must be utilized in the corps of airport officers in order not to lose experienced officers who, although no longer fit for flying, are nevertheless extremely valuable for ground duties in the air service; moreover a considerable economy is realized by this procedure.

On this account, therefore, the commissioning and promotion of air service line officers can not be considered separately from that of airport officers.

APPOINTMENT OF REGULAR OFFICERS

The stability of organization acquired by the Military Academy of Turin (founded over 100 years ago) and a consideration of the

several reorganizations of the Naval Academy of Livorno (Leghorn) lead to the conclusion that the most efficient arrangement of military studies, as required by modern exigencies, is based on the initial possession by prospective officers of high-school graduation certificates. The chief reason of this is that the young student, by the fact of possessing such certificate, enters the military schools with all-around education and is mentally receptive, with the result that it is possible to secure a maximum efficiency, reducing thereby the course of military instruction to a shorter period of time. A further advantage lies in the economy realized in the administration of the military school, as it is not necessary to teach the students subjects of general culture.

It must not be thought that the aforesaid certificate, which is adequate where air-service line officers are concerned, is excessive for future airport officers. In fact, the duties performed by airport officers in managing air stations or fixed plants in general, in maintaining discipline of the personnel, and directing mobilization operations are highly important, because an efficient ground organization is the basis for an orderly and efficient development of flying activities.

Consequently it has been decided that students desiring to enter the corps of airport officers must hold the high-school certificate and must take a two-year course of military studies. Therefore the first year of the regular course of the Royal Aeronautical Academy will be common to the two corps, with the exception of a few special subjects. This has the dual advantage of promoting the necessary spirit of comradeship among the two corps and of giving the line officer aspirants the option of definitely passing to either corps for the second year.

By this system a greater number of young men will apply for the aeronautical academy. In fact, should they prove inapt for flying duties during the first year they may continue to study for subsequent commissioning in the corps of airport officers. At the same time families will no longer be inclined to oppose the desire of young men to enter a hazardous career, because the final decision will be postponed for one year.

In order to provide for a possible and not improbable insufficient number of line officers, it is necessary to create an auxiliary course in addition to that represented by the regular course at the academy. Said course consists of a special course to which, after competitive examinations, the best reserve second lieutenants and noncommissioned officers aspiring to become permanent officers will be admitted.

On attaining the age indicated in the following table for the various grades of the line officers' corps and airport corps, officers are retired from active service.

Grades of air service line officers and equivalent of airport officers	Air service line officers corps (regular officers)	Airport corps (regular officers)
Commander general of military air service	53	
Air fleet commander	53	
Air division commander	53	
Wing commander	51	56
Wing vice commander	48	54
Group commander	45	51
Squadron commander	40	48
Squadron first lieutenant	40	48
Squadron second lieutenant	40	46
Student squadron second lieutenant		

The above age limits may be extended one year in the case of general officers still possessing the physical qualities necessary for exercising their functions (to be determined by prescribed rules).

Such extension may be granted twice in succession in the same grade.

In time of war extraordinary promotions for meritorious service at the front, duly recognized and cited in the order of the day by the supreme command of aeronautics in the zone of operations, may take place in all grades.

Any enlisted pilot may be appointed in time of war to the rank of squadron second lieutenant for merit, provided he is 18 years of age.

The minimum periods of service in grades and of duty with flying units are reduced one-half in time of war, and the minimum age required for appointment to the grade of squadron second lieutenant decreased one year.

The above periods of duty may be further reduced in the following cases:

(*a*) Promotion for meritorious service at the front.

(*b*) Impossibility of filling vacancies otherwise.

The rules governing the retirement-age limits of officers of all grades and corps are suspended in time of war.

The fact of being a prisoner of war does not affect the computation of seniority as far as promotion is concerned.

However, on returning to the air service, officer prisoners of war will be promoted only to grade immediately above that held by them at time of capture. Further promotion will be granted later, but only as they may be entitled thereto.

Up to June 30, 1924, three-fourths of the number of vacancies in the grade of superior officers predetermined for the strength of the air service line officers corps may be filled gradually by officers already serving in the air service, without taking into account the minimum period of service performed in the particular grade and with flying unit, provided this measure is necessary because of the impossibility of otherwise filling the posts of command.

The commissariat of aviation reserves the right to fill the remaining one-fourth of the vacancies of superior officers and the remaining one-third of the vacancies of inferior officers with regular officers coming from the army and navy who may apply for transfer to the air service up to June 30, 1924.

In the event of a subsequent increase in the strength of the cadres after June 30, 1924, one-half of the posts thus made available will be filled by promotion of officers belonging to the line officers corps, while the other half will be filled by officers of the army and navy who may apply for transfer to the air service under the agreement that they take the brevet of pilot.

Army and navy officers are transferred back to their respective arms and corps of origin if in the space of one year from the time of their transfer to the line officers' corps they fail to secure the brevet of pilot.

Upon the constitution of the airport corps the commissariat of aviation may fill two-thirds of the available posts of each grade, excluding second lieutenants, with regular officers and reserve officers of any arm or corps of the air service, army, navy, finance guards port commands, who may make application and are considered fully qualified, preference being given to former pilots and taking into account the war flying service performed by the last mentioned. Rank and seniority is established by special rule.

ITALY

NOTES ON A VISIT TO "GENERALE" CLASS DESTROYERS

June, 1924

Recently an opportunity was afforded for making a brief visit to the "generale" class of Italian destroyers, and particularly the *Generale Cascino*, which vessels were at Palermo, Italy, as an escort to the minister president, Signore Mussolini. The latter had embarked in the *Dante Alighieri*, and he was escorted by 12 destroyers, 14 hydroplanes, and 2 dirigibles.

The "generale" class of six destroyers comprises one division of the squadron. They were moored abreast, sterns to dock. Their equipment and deck stowage is seemingly quite alike. They carry paravanes. Their home port is Spezia. In port they permit fires to die out. A battery of cells supplies light while they are in port. The flushing system is idle. A crew's head, canvas screened, is improvised on the port side at the break of the forecastle.

The following additional points were noted:

(*a*) On the starboard side, aft, there is a smoke producer, said to be of Swedish manufacture, of which the following is a rough description:

Phosphorus is used, with a charge of about 10 pounds, lasting about 10 minutes and producing a heavy, thick, white, pungent smoke. It was said that this means of producing a smoke screen is satisfactory and cheap, and that during maneuvers en route to Palermo an excellent screen had been laid in the face of a fresh breeze.

Charges for the smoke producer are stowed in a steel box on the port side amidships.

(*b*) The deck is fitted with cleats to facilitate walking while in a seaway.

(*c*) Amidships, aft, there is a drum with quarter-inch wire mounted for towing a contact torpedo in antisubmarine work. No torpedoes were on board.

(*d*) Four depth charges are carried amidships. Tracks for launching are stowed about the deck.

(*e*) There are two twin torpedo tubes and two extra torpedoes; mechanism not seen.

(*f*) Port side, forward of amidships, there is an "Alfa-Romeo" gasoline engine, which operates an air compressor for use in getting up steam when cold.

(*g*) Crew's quarters are forward, engineer's below, as in our early destroyers. Quarters were not particularly clean. No bunks. Bags and hammocks soiled and not well stowed. Mess tables (types similar to ours) swung overhead. Watch, quarter, and station bill well drawn up and posted conspicuously.

(*h*) Galley on port side, forward. Uses coal.

(*i*) Bridge excellent, and navigation gear well kept. Magnetic compass. Dummy compasses and azimuth circles at sides of bridge, outboard of screen, accessible and unobstructed. Torpedo director and speed indicator similar to our "three-arm" instrument.

(*j*) Apparently much attention has been given to fire control, but the installation was not shown me. I was told that it was an outgrowth of war-time systems, developed entirely by Italians, and not British. Communication is by voice tube and indicator.

(*k*) Radio room under bridge, port side; 1-kilowatt set. New type of vacuum-tube detector, said to be highly satisfactory.

(*l*) Visited starboard engine room. Diagrams and lead plans posted conspicuously. Not clean. Oil leaks. Pumps not well kept. Bilges dirty.

(*m*) Officers' quarters aft. Complement, five; commanding officer, executive and gunnery officer, engineer officer, navigating officer, and

watch officer. Captain has large cabin with bathroom. Rooms of other officers vary in size and desirability down to that of the watch officer, who is a midshipman, and whose room is small and is otherwise used as a stowage space by other officers. There is one small shower bath for other officers. The wardroom pantry contains a coal-burning heater for heating the wardroom.

Officers stated that they experienced difficulty in obtaining experienced men, especially the specialists. They say that the seamen sent to them are from seagoing stock, and quite capable, but that their enlistment is for two years and that they are discharged before they have become well-trained destroyer sailors.

The commander of the squadron of which the *Generale* class is a division is said to be an excellent seaman, who served with distinction in Asia Minor. He is said to be very efficient and to keep his squadron quite active at drills and maneuvers.

From conversation with several of the aviators who were formerly naval officers, I gather that the formation of a distinct air force leaves much to be desired and that the naval element, at least, desires a purely naval character.

ITALY

NOTES ON THE NEW LOMBARDI TORPEDO AND PLANT

June, 1924

The inventor of the torpedo is Signor Francesco Schmid. The inventor has had experience in torpedo plants in Austria and Germany, with the torpedo vessels of the Italian Navy, and during the war was in France and England on torpedo work. He is a Neapolitan.

The plant has been in operation since 1914. It constructs Whitehead torpedoes for the Italian Government and other purchasers. It also makes boilers and radiators for heating purposes. At present there are 200 employees in the heating section and 400 in the torpedo section. The capacity of the plant at present is about one torpedo per day. This, however, is to be largely increased. The company does all the work and manufacturing in the construction of its torpedoes at Naples, Italy, except the manufacturing of explosives and forgings for the air flask, the latter being made in rough in Czechoslovakia, but are being turned down at the company's plant. They have a well-equipped launching and proving station on the island of San Martino, near Naples. The torpedo described is the 21-inch by 24-foot, unless specifically mentioned otherwise. They are pre-

pared to make torpedoes with the same performance, however, in other dimensions.

The following countries are some of those which have sent missions to investigate this torpedo: Italy, France, England, Japan, Denmark, Portugal, Brazil, Argentina, Turkey, and Norway. The Danish mission was there at the same time as was this observer. It was composed of a flag officer, understood to correspond to our Chief of Bureau of Ordnance, a captain in the Danish Navy, and a civilian engineer. It is expected that they will have observers to witness the tests to take place in August, probably taking place between the 1st and 15th.

These tests will be of the first 21-inch models constructed, of which there will be at least four. Previous tests were made last July of the 450-millimeter (17.72-inch) model. Slight modifications have been made since then, but it is planned to have all these latest improvements incorporated in the 21-inch torpedoes to be proven in August.

Italy has already ordered 100 of the 21-inch and 100 of the 450-millimeter (17.72-inch). The company is also to manufacture some special 5-meter, maximum speed, 2,000-meter range torpedoes for the Italian Government. They are to get a bonus of 1,000 lire for each knot of speed above contract. France plans to replace all her torpedoes and launching tubes with those of this company. It is not known how far the negotiations have been carried to a conclusion, but the drawings of the special features and modifications desired by France have been made and were seen. It is understood that France only wants an 11,000-meter torpedo. They are going to use the present French air flasks in the construction of the torpedoes for France.

The guaranteed speeds range between 48 knots for 3,000 meters (3,281 yards) and 24 knots for 20,000 meters (21,872 yards). The speed for 15,000 meters (16,404 yards) is 27 knots. The deflections guaranteed for these ranges are: 30 meters right or left at a range of 3,000 meters, 150 meters right or left at a range of 15,000, and 180 meters right or left at range of 20,000 meters. Those are the minimum deflections at any point of the run of the torpedo and not alone at the target. Setting of the range automatically causes the torpedo to run at the stated speed for that range. There are three settings of range, although the torpedo can be constructed in such a way as to give four settings. Depth setting may be regulated up to 12 meters (39.37 feet). They have designed and are constructing an attachment to the depth mechanism which will work as follows: For example, if the desired depth is 3 meters (9.84 feet), 3 meters is set on the depth index. After launching, as soon as the

torpedo reaches its depth, this device causes it to take a depth of 12 meters and run at that depth a certain distance, somewhat shorter than the range for which the torpedo is set. Upon reaching this distance the device permits the torpedo to come up to the depth set. It has been found that at 12 meters depth the torpedo runs without any perceptible wake. The distance which the torpedo runs will be made that desired by the people for whom the torpedo is being constructed. The company was asked about the effect upon the torpedo of launching at high speed. This has been considered. All torpedoes must be built to stand the shock of launching from a height of 6 meters (19.685 feet) according to the contract requirements of the Italian Navy. Also 2 torpedoes out of every lot of 12 are to be launched from a destroyer traveling at high speed, the destroyer to be provided by the Italian Navy. The rudders are of steel and are 7 millimeters (0.2756 inch) thick. There is no smoke-prevention device, the company claiming that the torpedo is smokeless. At the previous tests of the 450-millimeter (17.72-inch) torpedo, no torpedoes were lost, and there was but one cold shot due to fuse failure. Over 150 runs were made with one torpedo and it still is in practically new condition. The head lightening device was not found necessary, but it was added at the request of the Italian Government, as well as a new arrangement that will be incorporated in the 21-inch for blowing down the air flask at the same time the head is lightened, both working by the same controlling mechanism. It was stated that there was no difficulty in obtaining satisfactory depth performance at high speeds. The cards shown me were very good. There were no new streamline features involved in the torpedo, increased speed being obtained principally by the improvements in motive power.

ART. 4. (*a*) Characteristics:

Length over all, 7,500 millimeters (24 feet 7.275 inches).

Diameter, 533.4 millimeters (21 inches).

Weight of explosive charge, 250 kilograms (550 pounds).

Brake horsepower developed, over 450 horsepower.

Maximum guaranteed speed, 48 knots (54 knots developed by 450-millimeter torpedo in trial). This speed is for a range of 3,000 meters (3,281 yards).

Maximum guaranteed range, 20,000 meters (21,872 yards) at a speed of 24 knots.

Intermediate speeds with corresponding ranges can be set.

Air-flask pressure, 175 kilograms per square centimeter (2,489 pounds per square inch).

Air-flask test pressure, 230 kilograms per square centimeter (3,271 pounds per square inch).

Depth regulation up to 12 meters (39.37 feet).

Negative buoyancy of the torpedo ready for a war shot=230 kilograms (506 pounds).

Positive buoyancy at end of exercise run=plus 40 kilograms (88 pounds) for a run of 3,000 meters (3,281 yards) ; plus 45 kilograms (99 pounds) for a run of 8,000 meters (8,749 yards) ; plus 50 kilograms (110 pounds) for a run of 15,000 meters (16,404 yards). The above with the ordinary exercise head. With the head capable of being lightened the positive buoyancy would be from plus 60 kilograms (132 pounds) to plus 130 kilograms (286 pounds), depending upon the range and the amount of water used. (Negative buoyancy at beginning of exercise run, about 440 pounds.)

Weight of torpedo with exercise head, but empty throughout, about 2,640 pounds.

Weight of torpedo ready for exercise run, 1,540 kilograms (3,388 pounds).

Weight of the torpedo ready for war shot, about 3,630 pounds.

Torpedo withstands an external pressure of 8 kilograms per square centimeter (113.784 pounds per square inch), corresponding to a depth of 80 meters (43.74 fathoms). Upon request this torpedo can be constructed to withstand a pressure corresponding to 100 meters (54.68 fathoms) depth, a pressure of about 10 kilograms per square centimeter (142.23 pounds per square inch).

Cubical capacity of air flask, 725 liters (25.6 cubic feet).

Engine working pressure at maximum speed, about 34 kilograms per square centimeter (about 483.6 pounds per square inch).

Temperature of gases when delivered to engine cylinder, about 600° C. (1,112° F.).

Temperature of exhaust gases in exhaust chamber between engine and exhaust through propeller shafts=80° C. to 90° C. (176° F. to 194° F.). In the 450-millimeter trial torpedo this temperature was found to be 70° C. (158° F.).

Capacity of water compartment, 130 kilograms (286 pounds).

Capacity of lubricating oil tank, about 25 liters (52.8 pints).

Capacity of fuel compartment tanks (2), total, 12 kilograms (26.4 pounds) of kerosene.

Actual relation of fuel and water consumed, about 1 to 8.

Relation of fuel and air, by weight, 1 to 15.

Diameter of exhaust opening in tail, 65 millimeters.

Pressure in special flask in exercise head for lightening, about 50 atmospheres (735 pounds).

Diameter of forward propeller, 470 millimeters (18.5039 inches).

Diameter of after propeller, 450 millimeters (17.7165 inches).

Pitch of propellers, 1,418 millimeters (55.82666 inches).

Ratio, motor speed to propeller speed, 2 to 1.

Revolutions per minute of motor for maximum speed, 2,200.

Price of torpedo in small lots, about 360,000 Italian lire ($16,000) each for the 21-inch and about 180,000 lire ($8,000) each for the 17.72-inch.

CHINA

REVIEW OF CHINESE MILITARY OPERATIONS IN 1923

May, 1924

After his defeat at Wu Pei-fu's hands in the vicinity of Peking in the spring of 1922, Marshal Chang Tso-lin, commander in chief of all the Manchurian forces, retired to Mukden and set about rees-

tablishing his prestige among his own subordinates and reorganizing his army. All divisions were divided into mixed brigades, instructors of all sorts, both foreign and Chinese, were employed, and huge quantities of equipment and arsenal machinery were purchased. It was the popular belief in North China that Chang Tso-lin would attempt another descent upon Chihli in 1923. Foreign military observers were convinced that his preparations had not gone far enough to make such an attempt and did not anticipate it, but the Chihli military chiefs were fully convinced in March, 1923, that the Manchurian forces would invade Chihli before June of the same year, and hasty preparations were made for defense. Large bodies of troops were moved to strengthen frontier posts, and Wu Pei-fu's forces were prepared to move at a moment's notice and had assembled the required rolling stock on the railways.

These preparations naturally prompted Chang Tso-lin to make similar movements, and by the end of April a conflict seemed inevitable. Then came the Lincheng train robbery and the kidnapping of a number of foreigners by bandits, and the militarists of all factions were so disturbed by the prospect of drastic military action on the part of the powers that the impending war was put aside and completely forgotten. Marshal Wu Pei-fu nevertheless went ahead with various military adventures in Szechuan, Hunan, Kwangtung, and Fukien, and the reports of the success or failure of his subordinates in these various fields make up the bulk of the military news for the year. Wu Pei-fu's objective in all of these campaigns is frankly the obliteration of all revolutionary movements and the reunification of China by force.

The following paragraphs are written in an attempt to outline these campaigns in the briefest possible form.

KWANGTUNG

In the autumn of 1922 the Kwangsi commander, Shen Hung-yin, was wandering about in southern Kiangsi with 20,000 armed men, attached to no political group but keeping up his band by allowing them to loot and by blackmailing the various communities which they visited. Wu Pei-fu had by this time made up his mind to exterminate Dr. Sun Yat-sen and his following, but had failed to come to any working agreement with Gen. Chen Chiung-ming who, a few months before, had expelled Doctor Sun from Canton, so he decided to employ Shen Hung-ying against Chen Chiung-ming. Shen's services were secured through the intermediation of ex-Viceroy Tsen Chun-hsuan, leader of a political party known as the Cheng Hsueh Hui. Shen Hung-ying and his 20,000 marauders first

returned from Kiangsi into Kwangsi, their native Province, and then in January, 1923, invaded Kwangtung. Their descent upon the Province coincided with a similar invasion of Yunnanese, who had been driven out of Yunnan by Tang Chi-yao and who had crossed Kwangsi Province by slow stages, supporting themselves, like Shen Hung-ying's followers, by robbery and extortion. These two bands made common cause and, about January 26, 1923, were in the vicinity of Canton, whereupon Chen Chiung-ming's following evacuated after a few skirmishes and retreated to Huichow (Waichow).

Meanwhile Doctor Sun had been led to believe that these two movements were being conducted in his interest and had sent a number of his followers to take up various posts in Canton after Chen Chiung-ming's expulsion. These functionaries were seized by the invaders, and Mr. Hu Han-ming, whom Doctor Sun had appointed civil governor, narrowly escaped execution at the hands of the Kwangsi men. He was saved by the intervention of a Yunnanese general. In spite of this unfavorable beginning, Doctor Sun was convinced that an opportunity offered to regain his position in Canton; so he left Shanghai and arrived in Canton February 21. For a time he was virtually a refugee on an island in the Pearl River, but the inevitable breach between the Yuannanese and Kwangsi troops gave him an opportunity to retain the Yuannanese as his supporters, and Shen Hung-ying was driven back into his native Province in confusion. Wu Pei-fu was by this time preparing to concentrate on Szechuan, so Shen had no support except from Kiangsi, which was ineffectual. Sun Yat-sen then had an opportunity to consolidate his position in Canton. Having appointed himself generalissimo and satisfied the Yunnanese by giving them the proceeds from an opium and gambling monopoly, he followed Shen Hung-ying to his own border, and his forces took Wuchow July 8. Resting on this achievement, he turned his attention to Waichow, on the east, where Chen Chiung-ming's forces were concentrated. After months of determined but futile attempts to take Waichow, the Yunnanese, through the intermediation of Tuchun Chi-Hsieh-yuan, of Kiangsu, who presented them with $400,000, were persuaded to beat an orderly retreat in the direction of Canton. It was arranged that Chen Chiung-ming and his forces should follow up without attacking and after the Yunnanese had passed Canton seize the place and the persons of Sun Yat-sen and his following. Shekhung was taken by Chen's men November 12, and they were within sight of Canton when they foolishly attacked the retreating Yunnanese. The latter turned on them and in a few days drove them back to Waichow. Chen's troops lost heavily in fighting near Shekhung November 19 to 21, and all hope of their reaching Canton was given up when the

Yunnanese retook Shekiung November 22. Since then the situation has been a stalemate. Chen Chiung-ming and Wu Pei-fu now cooperate, and the former's troops hold all of eastern Kwangtung. Shen Hung-ying is said to be preparing a further descent upon Kwangtung. Kiangsi troops hold a few towns in northern Kwangtung. After the Yunnanese retreat in November, 1923, Sun Yat-sen recalled the defeated Tau Yen-kai from Hunan. The latter brought large bodies of Hunanese with him, and Doctor Sun has ever since maintained his position by playing the Hunanese and Yuannanese against each other. Military observers expect to see Chen Chiung-ming given strong support from Fukien this year and anticipate another invasion, under Wu Pei-fu's auspices, from Kwangsi.

In the autumn of 1921 invasions of Hupeh were undertaken by sympathizers with the southern cause from both Hunan and Szechuan. These Wu Pei-fu repelled with exceptional brilliance and thereby established his authority in northern Hunan and western Hupeh. The conflict with Chang Tso-lin was then a pending certainty, so the Szechuanese armies were not followed in their retreat beyond the Szechuan-Hupeh border. Szechuan Province itself continued to be involved in a triangular civil war which finally resulted in the retreat of a pro-Chihli commander, Gen. Yang Shen, into Hupeh. He brought with him the remnants of his army and found sanctuary in the city of Ichang. Wu Pei-fu's position was then that of inspector general of Hunan and Hupeh and enjoyed very real authority throughout Hupeh, so Yang Shen and his troops were dependent upon his favor for their residence and upkeep in Ichang. Yang Shen and his staff officers visited Wu Pei-fu's headquarters at Loyang a number of times, and in the latter months of 1922 finally persuaded Wu Pei-fu that the time was ripe for a conquest of unruly Szechuan, which would add that Province to the increasing total which acknowledged Peking's authority. Yang Shen was liberally supplied with money, arms, and equipment, and in February, 1923, began to move up the Yangtze River, supported by the regular army units stationed in Ichang and other river ports. Wanhsien was taken March 7, and a month later Yang Shen entered Chungking in triumph. From this time forward for many months there was incessant fighting in all parts of the Province, but little progress was made by anyone.

While Yang Shen was fighting his way west by the river route, another defeated and exiled Szechuanese commander, Gen. Liu Tsun-hou, who with his followers had found refuge in southwestern Shensi, was fighting his way back into the north of Szechuan, but also making no great progress. Liu Tsun-hou's enterprise was at first independent and was not regarded with much favor by Wu Pei-fu,

but before the end of the campaign he, too, was accepted as an ally and was working under instructions from Loyang. In September Yang Shen, whose position was precarious, was heavily reinforced by troops from Honan and Hupeh. Wu Pei-fu also secured the cooperation of a Kweichow general, Yuan Tso-ming, who had one brigade of Kweichow troops at the outset. The grand total of Wu Pei-fu's expeditionary forces in Szechuan in the autumn of 1923 was about 140,000. The so-called "southern" forces, under the general command of Gen. Hsiung Ke-wu, did not exceed 80,000. But even after being heavily reinforced the "northern" armies suffered heavy reverses. Early in October Yang Shen was replaced as commander in chief of the expedition by Yuan Tsu-ming. This did not save the situation, for on October 19, the southern forces of the First Szechuan Army reoccupied Chungking, and the entire northern expeditionary force commenced a retreat down river in the direction of Hupeh. It required nearly two months to bring order out of chaos in the northern ranks and to reequip the expedition, but in December Yank Shen and his colleagues advanced again and, December 12, took Chungking again. Progress thereafter was slow but consistent on all fronts. Tungchuan was taken January 28, 1924, and the northern forces under Yang Shen and Yuan Tso-ming captured the arsenal outside Chengtu, the provincial capital, February 7. The next day the southern first army evacuated the city, retreating south, and February 9 it was occupied by the northern forces. This virtually ended the campaign.

Hsiung Ke-wu let it be understood that he was not defeated and that he would make another attempt to drive out the northerners. There was also much talk of invasions from Yunnan in his support. But the northern forces have spread over the Province and consolidated their position, and it is certain that Wu Pei-fu, who is the best judge of the situation, feels that Szechuan is now a permanent addition to his sphere of influence.

HUNAN

In the early spring of 1920 the Anfu general, Chang Chin-yao, was tuchun of Hunan and supported his position in the capital with something like 40,000 troops. Wu Pei-fu, with his third division, was in occupation of southern Hunan, but was not cooperating with the tuchun and was openly hostile to the Anfu Government in Peking. He therefore evacuated his positions and started north, and thereby opened a road to Changsha to a provincial revolutionary force under the command of Gen. Tan Yen-kai and Chao Heng-ti. These leaders, with a single division of half-armed native troops, drove Chang Chin-yao and his 40,000 regulars from the Province

and set up an independent administration. A few months later Tan Yen-kai and Chao Heng-ti disagreed, and the former was expelled, while the latter set himself up as tuchun. To maintain his position, however, he was forced to delegate most of his power to subordinates, who were for the most part in sympathy with Tan Yen-kai. The latter threw in his lot with Dr. Sun Yat-sen and, in the autumn of 1921, sent a subordinate, Chiang Tso-pin, into Hunan to lead an expedition against Tuchun Wang Chan-yuan in Hupeh. This movement Chao Heng-ti was forced to join and lead. Wu Pei-fu opposed it, however, and the Hunanese were badly beaten between Yochow and Wuchang. After administering an overwhelming defeat to the Hunanese, Wu Pei-fu arranged for a conference with Chao Heng-ti at Yochow, at which it was arranged that the tuchun was to be supported in his position by northern troops in exchange for his allegiance to Wu Pei-fu and the Peking Government. The nominal independence of Hunan was not canceled at this meeting. From September, 1921, until July, 1923, Hunan was comparatively quiet. Then several obscure defense commissioners in southwest Hunan, who had been in correspondence with Tan Yen-kai, declared themselves adherents of Dr. Sun Yat-sen and champions of the revolutionary southern movement. The rebellion against Tuchun Chao spread to other parts of the Province, and Tan Yen-kai himself left Canton July 25 to assume control of it. Chao Heng-ti called upon Wu Pei-fu for help, offering to cancel Hunan's independence, but help was not immediately forthcoming. By September, therefore, Tan Yen-kai had control of the provincial capital and the greater part of the Province. Chao's troops revolted, and he himself fled to Yochow. Tan then appealed to Wu Pei-fu not to interfere, promising not to invade Hupeh if he were let alone. Wu Pei-fu, however, decided to support Chao Heng-ti and sent him strong reinforcements. By November Chao had regained control of Changsha and most of eastern Hunan, and Tan's forces were meeting with reverses at every encounter. At this time Doctor Sun was in serious difficulties in Canton, and it was recognized there that Tan Yen-kai could not maintain his position in Hunan; so he and his followers were recalled, and the Hunan rebellion came to an end.

FUKIEN

The movements and countermovements of various military leaders in Fukien are most difficult to understand and, when understood, still more difficult to explain to others in a brief narrative. The Fukien people are the least warlike in South China and have few if any armed forces of their own. They offer no resistance to marauding bands of soldiers or bandits from other Provinces, but provide

a rich field for the armed adventurer. Several factions are always contending for the political control of the Province, and in addition to these there are always forces moving about which represent no policy or faction, but are looking for fields of exploitation. In 1922 Li Hou-chi was tuchun of Fukien and controlled the northern half of the Province. The southern half was sometimes under his control, sometimes under Cantonese adventurers, and sometimes under insubordinate northern commanders. Li Hou-chi is a cousin of the notorious Anfu leader, Gen. Hsu Shu-cheng, and was always regarded as an Anfu retainer and a subordinate of Marshal Tuan Chi-jui. In 1922, however, he deserted this party and became an ally of Wu Pei-fu. His cousin, Hsu Shu-cheng, then went to Fukien and conspired to expel him. His chief fellow conspirator was a brigade commander at Yenping, on the Min River, Gen. Wang Yung-chuan, then a subordinate of Li Hou-chi. About the middle of November, 1922, this conspiracy ended in a raid on Foochow, the provincial capital. Li Hou-chi fled to Formosa and thence to Swatow without any resistance, although he had under his command in the city at least a full division of loyal troops. Dr. Sun Yat-sen's favorite military supporter, Gen. Hsu Chung-chih, who had been driven out of Kwangtung by Chen Chiung-ming's armies, shortly appeared on the scene with a large body of Cantonese bandits organized into military units and collectively known as the "Min Chun," or People's Army. General Hsu and his staff cooperated to some degree with Gen. Wang Yung-chuan to hold Fukien for a few months. Doctor Sun was then in Shanghai, but when he determined to return to Canton, General Hsu also set out for Kwangtung with his Min Chun to give him support in his native Province, leaving Wang Yung-chuan in full control. The Min Chun began moving in January, 1923, and were well on their way in February. General Hsu himself left Foochow February 4.

Meanwhile Marshal Wu Pei-fu was naturally displeased with the ousting of his ally Tuchun Li Hou-chi and prepared with characteristic energy to retake Fukien. Gen. Sun Chuan-fang, then in command on the upper Yangtze River, with his base at Ichang, was ordered to proceed with all available troops into Kiangsi and, from Kiangsi, to move overland into Fukien. His forces were greatly increased through recruiting in Honan, chiefly among the bandits, and he finally started on his way through Kiangsi in February with approximately 30,000 men. By March 15 Sun Chuan-fang and his whole force had passed Yenping, Wang Yung-chuan's former base. Since Wang Yung-chuan had ousted Wu Pei-fu's champion, and since Sun was entering the Province as Wu's new champion, it was expected that he would drive out Wang, instead of which he came

to terms with him. Sun was appointed tuli—a new term for tuchun—and Wang was made vice tuli. Sun arrived in Foochow about April 6, and, having ensconced himself, began to make preparations for ejecting Tsang Chi-ping, another Anfu general, from Amoy. This campaign was intrusted to Wang Cheng-ping, with the cooperation of several gunboats, but, pending the arrival of ammunition from the north, it did not develop until midsummer. In the meanwhile, toward the end of April, large bodies of southern troops, mostly Min Chun, attempted a raid on Foochow.

Sun Chuan-fang did not check these forces until they were within 10 miles of Foochow and had not cleared the district of them until June 9. The defeat of Hsu Chung-chih's troops by Chen Chiung-ming's subordinates in the Swatow district and the defection of the troops of another Cantonese leader, Li Lieh-chun, relieved Fukien of fear of a Cantonese invasion from the south. Early in May Sun had moved several brigades up to the Chekiang border, and it was reported in the north on good authority that Sun was preparing to cooperate with the Kiangsu tuchun, Chi Hsieh-yuan. When it became apparent in June that there was little or nothing further to be feared from Kwangtung, it was still more insistently rumored that Sun was preparing to invade Chekiang, but all these surmises came to nothing when Sun suddenly left Foochow, June 13, and proceeded to Shanghai, afterwards visiting Hankow, Loyang, Peking, and Tientsin and showing no disposition to return to Fukien. Wang Yung-chuan was left in charge of affairs there and apparently enjoyed the confidence of Peking and Wu Pei-fu. Sun had returned to the north to insist personally upon a supply of arms and money, and evidently found it such a difficult job to get the sort of support that he wanted that he did not return to Foochow until September 17.

It was immediately obvious that his position was not a comfortable one. Wang Yung-chuan had strengthened his position and was not inclined to share his authority with Sun. Wang's campaign against the Amoy commander, Tsang, appeared to have been little more than a raid upon the Fukienese people. While reporting to Peking what strides he was making against Tsang, he was also reporting to Marshal Tuan, the Anfu chief, that he was not fighting Tsang but the Min Chun. Through the forced growth of opium and other impositions he made himself very unpopular with the unfortunate natives.

Early in December Sun Chuan-fang prepared to move, and the press at large immediately jumped to the conclusion that he had found his position in Fukien untenable and was preparing to carve out a new realm for himself in either Chekiang or Kiangsi. The public was convinced of the truth of this assumption when in February, 1924, Sun Chuan-fang began moving his own troops out of Foochow and up the Min River, which looked like a retreat into Kiangsi

along the route of his original invasion. He himself left the provisional capital February 27. Ten days later, however, he was back, and Wang Yung-chuan was in full flight with the remnants of a defeated and scattered force. Sun's retreat was only a clever feint executed under Wu Pei-fu's orders, designed to throw Wang and his Anfu colleagues off their guard, and his return was an irresistible assault upon Wang, who was wholly unprepared. Wang was in Hsinghua by the time that Sun himself arrived in Foochow, March 7, and there has been no reliable information upon his movements since then. There have been heavily discounted rumors of the subsequent taking of Foochow by Tsang Chi-ping, of Amoy, but it is generally assumed in Peking that Sun is now firmly established in Foochow and that he will be able this summer to bring the entire Province under control.

GERMANY

LINE SHIP, SUBMARINE, AND AIRCRAFT

[Translation of an article by Herr Ahnhudt, chief naval constructor]

During the days of sailing vessels naval power rested exclusively with the line ships. The introduction of armor plate and the further development of guns increased their superiority still more. In all navies, with the exception of the British, the other types were far behind.

To-day there is a strong feeling against the line ship. At the Washington Conference the line ship and equivalent battle cruiser were sacrificed. France abandoned the idea of a substitute for the *France*, and in England the advocates of aircraft sharply opposed the Admiralty's idea of starting the construction of the two line ships authorized by the treaty of Washington. The opponents claimed that the line ship is an obsolete type because it can be easily destroyed by the submarine or airplane, whose cost is only a fraction of that of a line ship. The purpose of this article is to examine these various points of view. To do this it is first necessary to examine the effectiveness of the weapon used to combat the line ship as well as the effectiveness of those at the disposition of the line ship for its defense. By this we mean not only the line ship itself but also the armored cruiser which nowadays represents merely a special type of line ship.

GUN CARRIERS

The weapons against the line ship are the gun, the torpedo, the mine, and the bomb. In the early days there was only the gun, which even to-day exceeds all other weapons in importance. Soon after

the introduction of machinery it developed in weight and size to such an extent that it could only be carried by a ship of large displacement, such, for example, as a line ship. Smaller ships, celebrated as monitors, could only carry fewer or smaller guns on account of their size, or were otherwise inferior in seaworthiness, armament, or speed, so that they did not come into question as serious opponents. The English monitors built during the World War were not destined to combat our fleet, but were intended to be used solely against coast defenses.

SUBMARINE MONITORS

The English submarines of the M class, which were built during the war and carried a 30.5-centimeter or 34.3-centimeter gun in addition to the torpedo armament, must be classed among modern monitors. The boat can submerge with loaded gun so that only the muzzle of the gun and the periscope extend above the surface of the water. The gun can be fired when in this position. The ship must rise to the surface in order to reload. Owing to the requirements of stability the gun can not be trained toward the side but must turn with the whole boat. This vessel with its gun can never combat a line ship.

SUBMARINE LINE SHIPS

Italian constructors have also designed a submarine line ship with heavy artillery equal to that of surface ships. The critics are quite right in claiming that the weight of the two machinery plants necessary for subsurface and surface work, as well as the special devices for submerging, require either a great increase in displacement or economies in weight elsewhere should the displacement remain the same. This would naturally work to the vessel's disadvantage when in combat with a surface ship. The submarine line ship would still be a line ship and therefore has no effect on the general discussion in question.

COAST ARTILLERY

In the present stage of technical development artillery equal to that of a line ship can only be carried on the water by a ship of this type. There is then the question of the danger threatening the line ship by the coast artillery whose cannons are equal to the ship's guns. We have no recent experiences to illustrate this fact, as there have been practically no operations between modern line ships and modern fortifications. We must depend solely on the effect of the land guns in a naval battle. It is well known that modern armor can be pierced by heavy shells on the firing stand. The practice of firing tests against ship targets and, above all, the recent naval battles have shown that artillery under certain circumstances can seri-

ously damage an armored ship by a single hit and put it entirely out of commission. However, as a rule it requires considerable time and a large number of hits to sink a properly constructed line ship through artillery fire alone. But the experiences of the late war showed that even a very badly damaged ship which was still afloat could be put into fighting trim by modern aids in an appreciably short period of time. The line ships destroyed by artillery at Gallipoli were old types. The German predreadnought armored cruiser *Bluecher* after it had been rendered defenseless was subjected to the fire of five modern English armored cruisers, far superior in displacement and armament, for nearly two hours more before it finally sank. Several torpedo hits, apparently seven, finished it. Our armored cruisers suffered greatly in the battle of Skagerrak, but none were sunk by artillery fire. There were constructive errors in the English armored cruisers which were destroyed in this battle, as shown by the fact that immediately after the battle the protection of the ammunition compartments on all English ships was improved, and in the large battleship whose construction embodies the experiences of this battle—that is, the English armored cruiser *Hood*—special emphasis is laid on the protection of the ammunition compartments against artillery fire.

TORPEDO PROTECTION

While the effect of artillery fire can be restricted in ample time through a continually improved system of vertical and horizontal armament, together with splinter bulkheads and gas bulkheads, as well as good damage control and fire-extinguishing devices, the only protection against torpedoes and mines having the same effect as torpedoes was, up to the beginning of this century (and with the exception of a few test devices in France and Russia), the antitorpedo net, which, however, was only effective when the ship was stationary and otherwise had to be removed. However, it was useless when the torpedoes were equipped with net-cutting devices. It was only after the Russian-Japanese war that ships were given a permanent torpedo protection—a province in which Germany led. For example, in 1918 our *Goeben* received five mine hits in one day and could still carry out the operation in hand and reach harbor. To-day things are so that a modern large battleship no longer needs to fear torpedo fire. If the propellers or the rudder are undamaged, such a hit, which only induces a list of about 3°, easily equalized by counterflooding, would scarcely cause the ship to leave the line. Attempts have been made to increase the efficiency of this weapon by the shell torpedo, in which the torpedo head carries a grenade exploding in the ship after impact, or by a torpedo which detonates against the bottom,

which in present constructions is still unprotected. If these attempts are successful (and practical constructions have already been tested), then the large battleship will again be subjected to the danger of torpedo fire. For instance, in the effort to put the ammunition as far as possible out of the way of enemy shells, the ammunition chambers on the *Hood* are located directly on the inner bottom, which is an especially dangerous position when the torpedo detonates underneath the ship.

On account of their short range in comparison with artillery fire (which limits to a great degree the possibilities of hitting the enemy line), the slight speed, and the small number of available torpedoes, the torpedoes on board a large ship play a secondary rôle in a battle with a line ship, and in my opinion had no successes to their credit during the late war. Nevertheless the fact can not be denied that they can be advantageously used under certain conditions, and they therefore have been retained on all the modern large battleships and the number of torpedo tubes has even been increased. The idea has often arisen of giving ships a strong torpedo battery as main armament, together with high speed and heavy armor which enables the ship under fire to approach close enough to the enemy forces to be able to destroy them by torpedo salvos. The ship, however, in order to carry the heavy armor at the high speed required, must be as large and as expensive as a line ship, which is the reason that such a type has never been constructed.

TORPEDO BOAT

If the torpedo is only a secondary weapon on a large battleship, it is the chosen and principal weapon of the small ship, which is able to carry the light torpedo tubes but no heavy artillery. The torpedo boats—small, rapid, and very mobile vessels—which can be built in large numbers owing to their cheapness and small crew necessary to man them, were quite correctly adjudged the real enemies of the line ships, especially at the time when the latter's artillery consisted of a few heavy and slowly firing guns. The introduction of the rapid-fire gun of medium and light caliber and the improvement of the searchlight removed a great deal of the terror of a torpedo boat. The English torpedo-boat attack on our fleet after the battle of Skagerrak, which was repulsed with very great losses, showed that a medium artillery under expert handling is superior to a larger number of torpedo boats. Our energetic attack against the British in the same battle, in spite of the firing of over 100 torpedoes, caused no damage with the exception of two hits, which were unable to sink any vessels. On account of the increased demands for speed and steam radius, the boats had become

so large that they formed an excellent target for the enemy's artillery. The displacement, which in the first boats was less than 100 tons, increased in the case of the destroyers, until at the time of the war it was about 700 to 1,000 tons, and the vessels of this type to-day have a displacement of 2,000 tons and over. The main purpose of the first boats—i. e., to form a cheap weapon against the line ship—disappeared with the increase in cost and the possibility of approaching the enemy unseen (impossible owing to their large size—they are larger than the first small cruisers). On these large torpedo boats the gun with a caliber up to 15 centimeters is a weapon of equal value to the torpedo tube, which fact gives the boat other tasks besides that of combating line ships. These tasks do not come up for discussion here and are covered by the English term for this large type, i. e., flotilla leader.

MOTOR TORPEDO BOATS

An attempt has been made to increase the value of the torpedo boat as a combative agent against line ships by reducing its size through improving the machinery and removing all the many constructional and technical parts added in recent years. During the war boats were built as small as 5 tons, carrying extraordinarily light motors in place of steam propulsion and possessing very high engine performance and high speed in good weather. Some types had a speed as high as 40 knots. The armament consisted of one or two especially light torpedo tubes. On account of their small size the boats are, of course, not very seaworthy or comfortable, so that they can only be used for very limited operations.

SUBMARINES

The torpedo is hidden much better on the submarine—a type of vessel which already during the War of Secession carried out a successful attack against a warship—naturally in a most primitive form, but one which demonstrated the possibility of development which only took place after the invention of the Diesel motor. Viewed with mistrust before the war, its success against warships at the beginning of the war and, later on, our commercial warfare, gave this type great popularity, so that a cool, correct judgment of its worth will disappoint many readers. The displacement of our last pre-war boats amounted to 600 to 700 tons and was increased to 2,300 tons during the war. The surface speed increased in individual types from 9 knots to 17 knots, while the subsurface speed remained practically unchanged—maximum, 9½ knots. The armament consisted of from 4 to 6 torpedo tubes. At the beginning the submarines carried no guns, but after a short time one or two light

cannons of from 5 to 8.8 centimeters were installed, until the opening of the commercial warfare, when it became necessary to have stronger armament, and guns of from 10.5 to 15 centimeters were used. The further development of our submarines (which is especially mentioned here, as we were in advance of the other nations) promised great success, but was arrested by the treaty of Versailles. The displacement of about 700 to 1,000 tons is now apparently considered sufficient by England and France. America, however, has a type of 2,000 tons, and Japan presumably has one of 3,000 tons. The increase in displacement appears to be used merely for increasing the surface speed and the radius of action. This has the advantage of providing more comfortable quarters for the crew during long trips, which is impossible on small boats. Nothing is known of any increase in subsurface speed worth mentioning.

LOW SPEED

The weakness of the boats lies in their low speed. This is caused by the double set of machinery (electric propulsion for subsurface work and, as a rule, Diesel motors for surface work) which at the present time is found on all boats. The attempt to substitute light steam turbines for the Diesel motors has not been successful as yet. The English K class vessels equipped in this way are viewed as a failure, although their surface speed amounted to 24 knots with 10,000 horsepower. The French also abandoned this type.

The ordinary speed of scarcely more than 17 knots surface speed and 10 to 12 knots subsurface speed is thoroughly insufficient in so far as regards line ships and large cruisers, which have a speed of from 20 to 30 knots. Furthermore, the great success of submarines against warships also reduced the number of cases in which ships remain stationary or move very slowly. The line ships in question were all old types, such as the *Formidable*, *Triumph*, *Majestic*, and *Suffern*. The English Grand Fleet gave our vessels no opportunity to attack. In a combat with line ships the low speed will also not be equalized by the long radius, which is more important for commercial warfare. When it seems advantageous that a submarine lie in wait for the enemy for a long period of time in order to blockade a squadron, this possibility can not be effectively used, as the enemy forces will understand how to prevent the submarines lingering too long near the enemy base. A further disadvantage (and a great one) is that although the submarine can remain hidden until the moment of firing, the swells caused by the shell and the wake of the torpedo betray its presence. If torpedo boats are in the proximity (which will always be true during an attack on a modern line ship or a fleet) then the submarine is lost, as there is little prospect of escape,

owing to its slight subsurface speed, and it will be destroyed by subsurface bombs without having attained more than merely tearing a hole in the outside of the line ship. It is possible to make the torpedoes invisible, and this must be done, at least in the case of the boats attacking in daylight.

ANTISUBMARINE DEFENSE

We have seen that the defense against torpedo boats rests with the artillery—mainly with the medium artillery. This is useless as a weapon against submarines, as the latter can not be seen. The defensive measures of the line ship can therefore be merely passive, i. e., in getting out of the way of the torpedo and being constructed torpedo proof. Active defense must be transferred from the large ship to the auxiliary ship, principally to the torpedo boats or destroyers which surround the fleet as protection. Airships and airplanes serve the same purpose. These are operated from land, from mother ships, and also from battleships, and during the last war English aircraft destroyed 12 German submarines. Finally come the listening devices developed during the war and which, operated from land, from ships, and also from airships, locate the submarines and report their position to the destroyers. Nevertheless, attack and defense are still in the preliminary stages. It seems as though the defensive measures are now superior to those of attack. In considering the submarines' successes during the war the question of surprise must also be taken into consideration. The submarine was a new weapon: it had beginner's luck against older ships, there were no antisubmarine weapons—all of which explains the initial overvaluation of the submarine as a weapon. During the entire war, apart from the damage to the defenseless *Blucher*, our line ships and large cruisers only had seven torpedo hits, and only one line ship, the *Pommern*, was sunk by a torpedo. If in the last war the report of the appearance of a submarine was sufficient to keep a whole fleet in the harbor, this will not be the case in future wars. The submarine will have enough to do getting out of the way of its pursuers.

MINE LAYING

As a matter of thoroughness it should also be mentioned that the submarine has also been very valuable as a mine layer, and this work will play a very important rôle in any later war, even though the number of mines which can be carried by the submarine may be exceedingly small. As a weapon against line ships the mine (in so far as effect is concerned) ranks with the torpedo. As long as it does

not detonate against the bottom it will never destroy any modern ship. The reason the English line ship *Audacious* was lost is that it had insufficient torpedo protection.

SUBMARINES IN COMMERCIAL WARFARE

If the prospects of the submarine as a weapon against the line ship can not be judged in a favorable light, no criticism can be made regarding the value of this weapon which proved of such great service to us in the late war. It is very effective in commercial warfare, and if it were possible to save the human lives involved it would be an ideal weapon. Great speed is not necessarily a factor, as freight steamers seldom have a speed exceeding 10 or 12 knots. The subsurface speed is also approximately sufficient for this purpose. However, the submarine cruisers of the future, destined for use in commercial warfare, must be far superior to the armed merchantmen in point of artillery so that it will not be necessary to attack submerged. The submarine will only submerge when breaking through a blockade, evading pursuers, attacking a warship or a strongly armed merchantman or a convoy, or when cutting off a ship's course. Its long radius is also of value in cruiser warfare. During the war, a German submarine went to America and back, a distance of over 7,000 miles, without having to refuel. The German submarine *U-79*, delivered to France, and now called *Victor Reveille*, recently made a trial trip, remaining at sea 60 days without refueling or taking on supplies. It covered about 10,000 miles, all of which shows the seaworthiness of a fairly small boat of 750 tons. Our last large submarines had a radius of approximately 20,000 miles, while even the newest small cruisers of the American and Japanese Navies have not more than about 12,000 miles.

FUTURE OF THE SUBMARINE

No predictions can be made at present regarding the probable development of the submarine in the future. One important improvement, i. e., in the subsurface speed, can take place if a machinery plant is found which, being light in weight and requiring slight space, will be equally good for surface and subsurface propulsion. However, there are no prospects of such a plant at the present time.

TORPEDO PLANES

A much more dangerous torpedo carrier than the submarine is the torpedo plane, which has the one quality lacked by the submarine, that is, high speed. An English type had a speed of 150 knots. The torpedo plane approaches the ship at a height out of

reach of artillery and antiaircraft fire. It then descends in rapid gliding flight and launches the torpedo in the direction of flight when 6 to 10 meters above the surface. The torpedo is operated by the ordinary devices and strikes the target under water, while the plane endeavors to escape. Owing to the small size of the plane and its great speed, it has a better chance of success than the torpedo boat, especially when it is hidden by a smoke screen laid by the other airplanes.

AIRPLANE TORPEDOES

The airplane torpedoes can have a much shorter radius than those used on torpedo boats, as they can be fired much closer to the target. It is known that the Japanese model, with a caliber of 457 millimeters, has a radius of 4,000 meters at 29 knots and 2,500 meters at 41 knots, while the normal torpedo in Japan has a caliber of 533 millimeters and a radius of 18,300 meters at 22 knots and 4,000 meters at 45 knots. Of the English airplane torpedoes, the larger appears to be similar to the Japanese (weight, 1,250 kilograms), while the smaller (700 kilograms) has the same weight as the French. Nothing has been made public regarding the explosive charge. It is probably of the same caliber as the normal torpedo, as in an airplane torpedo a saving can be made in the radius and mechanical performance, but the torpedo casing must be of much stronger construction in order to withstand the strain induced by impact with the water when launched from the plane.

WAR EXPERIENCES

During the war we sank an English merchantman by airplane torpedoes and the English sank a Turkish transport. This weapon was only developed during the war, but advanced so far that toward the end of the war the English planned an extensive attack against our fleet in Wilhelmshaven which did not, however, take place.

NEW TESTS

After the war various tests have been made with this weapon, all of which have been satisfactory and in which hits were attained in 50 per cent of the cases. For example, our line ship *Baden*, which was delivered to the enemy, was sunk by an airplane torpedo. Airplane torpedoes with angular firing have also been tested. As war conditions are lacking in all these tests, especially as regards enemy counteraction, no deductions can be made regarding critical instances. Nevertheless this type is only in the very early stages and may well replace both torpedo boat and submarine as an offensive weapon against line ships.

DEVELOPMENT OF THE AIRPLANE

The torpedo plane has brought us to the weapon which to-day is considered the principal weapon against the line ship; that is, the airplane. The submarine from the very beginning was destined as a weapon against ships, but the significance of the airplane in this regard only became recognized during the war. Considering the age of the airplane, this is not at all surprising. The Wright brothers, after whom their grateful country has named an airplane carrier, first flew in 1903 in an airplane equipped with a motor and having a radius of 250 meters. In 1904 the radius was 4 kilometers and the following year 40 kilometers. To-day the record for the longest nonstop flight is 3,250 kilometers, for the longest flight period over 35 hours, and for the speed about 350 kilometers per hour. Airplanes are used for military transports carrying from 20 to 30 soldiers with full equipment, and squadron flights have taken place in good order and during unfavorable weather, covering a distance of 1,200 kilometers. These are figures which are probably already exceeded. No other weapon has made such rapid strides, and no other shows such great promise for the future.

AIRPLANE TYPES

As a general thing, the Navy only uses seaplanes. During the war England also used landplanes for naval operations, as the seaplane was not yet sufficiently developed. These took off from the airplane carriers or the gun turrets of battleships, but both were maneuvers that required unusually good nerves owing to the incompleteness of the arrangements for starting and landing. Later on seaplanes, whose maximum radius toward the end of the war was 400 miles, were brought to the scene of action on airplane carriers and then let down to the water, from where they took off from their own power. After finishing their tasks, they landed at the mother ship and were hoisted on board. Both operations—taking off and landing—were only possible during good weather and when there was little sea.

MILITARY AIRPLANES

Transport, artillery observation and reconnaissance airplanes, fighting, torpedo, and bombing planes were used for military purposes. The first three do not need to be considered in this article, nor the fighting planes either, which armed with machine guns were to descend on the line ship and drive the men away from the antiaircraft guns in order to clear the way for the bombing planes. These planes were unable alone to combat the ship. The men at the guns can also be easily protected by properly shaped shields or

plates; and as the airplane must descend fairly low in order that the machine-gun fire may be effective, it is also in great danger from the antiaircraft fire.

BOMBING PLANES

Torpedo planes, which have already been discussed, and bombing planes are the real weapons against line ships. During the war they had no success, as far as I know, against line ships in the few cases in which they were used. However, later on, the experiences of the war were supplemented by extensive bombing tests. The American tests showed that direct hits on the ship were not dangerous in spite of the apparent damage they caused. Even a torpedo boat (our *G–102*) required 47 bombs, albeit of small caliber (mine hits), before it sank. On the *Ostfriesland*, the 900-kilogram bomb detonated on the armored deck and did not reach the vital quarters of the ship; that is, the ammunition chambers, engine and boiler rooms. The important parts above the armored deck, such as the heavy guns and the pilot bridge, had armor protection which is said to have withstood the heaviest bombs. In order to be effective against line ships, even in the case of direct hits, the bombs must be so constructed as to penetrate not only the upper deck (which has usually armor protection) but also the splinter deck. According to French statistics, a bomb of 500 kilograms thrown from a height of 2,000 meters has the penetrating power of a 10.5-centimeter grenade at 1,500 meters, and will therefore only penetrate one of these decks which are at least 25 to 30 millimeters thick. The French plan is to construct airplanes that can carry a charge of 5 tons to an altitude of 5,000 to 6,000 meters, besides their own weight of about 20 tons. Such an airplane is very much larger than the well-known German Staaken passenger plane, which weighs only 9 tons but has a span of 32 meters and a length of 18 meters. It is a question as to whether with such giant planes, which afford a splendid target for the enemy aircraft and fighting planes, the development of the airplane will not be forced along the same lines as that of the torpedo boats, which with increasing size were alienated more and more from their original purpose; that is, to combat line ships.

The heaviest bombs constructed at the present time weigh about 2,000 kilograms and have an explosive charge from 1,000 to 2,000 kilograms. Therefore, as far as explosive effect is concerned, they are far superior to the torpedo of 200 to 250 kilograms and the 40-centimeter explosive shell with only 90 kilograms explosive charge. It is to be assumed that armor-piercing bombs must be built much heavier, which sacrifices the explosive charge to the body of the bomb. Furthermore, it is quite understandable that the ship constructor, as soon as he must count on bombs of this kind, will

safeguard his ship through proper arrangement and strengthening of the horizontal armor plate and thus withstand the bomb as successfully as the shell.

SUBSURFACE HITS

The *Ostfriesland* and the line ship *Indiana* were sunk in bombing tests in which the bombs did not detonate on the ship but in the water at a certain distance from the ship. The Americans drew the conclusion from this that a bomb detonating in the water at a distance of about one-half the ship's width from the side is much more dangerous than a direct hit on the ship or immediately beside it, while the English claim that a 3.6-ton bomb detonating 3 meters from the ship has the same effect as a torpedo detonating on the ship's side.

TORPEDO EFFECT

Both are true in a limited sense. A torpedo or (which has the same effect) a bomb detonating directly on a ship, or a mine, has a very great effect within the target, which we will call the interior effect. The detonation takes place where there is the least resistance, and that is through the outside wall. The stream of gas which enters the ship through the opening continues on its way as a gas ball until stopped by some obstruction, one or more especially thick bulkheads, which in our ships were behind the coal. The lateral effect—that is, longitudinally and upward—is comparatively small as compared with the interior effect. If the explosive point is removed from the outer wall, then the latter is no longer strained in one small place but over an extensive area dependent on the distance of the explosion point. Whether this strain will cause bulging, leakage, or splitting, and to what extent, depends on the construction of the outside wall, when the explosive charge and the distance from the explosion point are the same. However, in the line ships which took part in the late war the outside wall was constructed for the torpedo or the mine—that is, for detonation direct on the outside wall. If there was no armor protection here, which was impossible for many reasons, the outer wall could not be constructed strong enough—the torpedo and the mine would penetrate in every instance. As their splinters had the same effect as shell splinters and were more dangerous for the interior bulkheads than the gas impact, an attempt had to be made to keep the splinters as small as possible and construct the outer wall as thin as possible. In the new American line ships this outer wall is, for example, only 9.5 millimeters thick. The longitudinal strength sacrificed here is borne by the torpedo bulkheads.

BOMB EFFECT

This form of construction was doubtless correct for torpedoes. The conditions are quite different, however, in the case of bombs which detonate at a greater distance from the outer wall. The pressure on the outer wall from a certain distance from the explosion point is not so great that it can not be borne by a strongly built wall. The light type of construction, which is the correct form for torpedo hits, breaks much quicker in the case of bombs than one which is unfavorable for torpedo hits because too strong. This was illustrated in the case of the *Ostfriesland*. It was protected against torpedoes; this was proved by the action of a number of our other ships equipped with the same torpedo protection, but her thin outer wall could not withstand the pressure of the bomb detonation. Great strips were torn in her, and as nothing arrested the inpouring flood of water she sank. It would be a sophism to conclude from this that a bomb is more dangerous to a ship than a mine or torpedo.

The English idea that the effect of the 3.6-ton bomb at a distance of 3 meters has only the same effect as a torpedo is also false. The interior effect—that is, the strain on the torpedo bulkheads—may be the same in both cases, but the lateral effect is doubtlessly much greater with the bomb and a greater area of the outer wall will be destroyed than with a torpedo.

The new weapon requires a new protection, and it will be the task of the naval constructor to find this. At all events, he must decide what is the main danger, for it will be difficult to provide the same measure of safety against both torpedoes and bombs. The English claim that such a solution has been found must be accepted with great scepticism.

GAS DANGER

Attention must be paid to the gas battle, not only on land but also on the water. Tests have been made with bombs filled with poisonous gases, so that the target would be hidden in a poisonous cloud which will be drawn into all the rooms of the ship through the artificial ventilation. It appears doubtful whether the gas danger will have the same significance in naval warfare as on land, as the air is always in motion and the ship can move at high speed. The ship also has quite other weapons and means to combat this element than the land troops. The Washington Conference prohibited the use of poisonous gases.

ANTIAIRCRAFT GUNS

With proper construction, a line ship can withstand several torpedo or bomb hits, but even the best-built ships must finally succumb to these weapons if they do not defend themselves, and there-

fore the most active antiaircraft measures must be tried out. As aircraft is still in its infancy and still in process of development; the same is true of antiaircraft defense. The first in order are the antiaircraft guns, light guns with a caliber of 7.5 to 10.5 centimeters, which have great altitude range and are so installed as to have the most open firing field possible in point of altitude and not to be hindered in action by the rigging, etc. I do not know of any successful naval operations in antiaircraft defense. It also requires a great deal of ammunition; Loch, the American, counted on 1 per cent hits, but it is questionable whether a line ship could carry sufficient quantity of ammunition to defend itself against a large number of attacking airplanes. If it is assumed that antiaircraft defense may improve not only in point of the guns but also method of firing; nevertheless the firing training suffers greatly from the lack of military targets, and it will always be very difficult to hit the small and rapid target represented by the airplane. On the other hand, antiaircraft fire will force the airplane to even greater altitudes, which is disadvantageous for the accuracy of bombing, so that only a large number of airplanes operating together can count on success. However, the value of antiaircraft defense is subject to very divergent views, but one point is agreed and that is that the most dangerous enemy of the airplane is not the gun but another plane carried either on special aircraft carriers or on the line ship itself.

STARTING AND LANDING DEVICES

The principal point in this is that the taking off and landing can take place without difficulty, even on ships moving in group formation, so that the ship neither has to stop nor alter its course. As the airplane takes off against the wind, the starting and landing devices must be reversible. Experiments were made along this line even before the war, and now such devices are found on aircraft carriers and in America have been installed on all warships. For taking off, there is a reversible framework with the airplane resting on the rails. The plane is then started by a mechanical catapult so that the speed when leaving the device is equal to the actual flying speed of the airplane. According to reports which have come to our attention, the catapult is understood to be satisfactory at least with light planes. However, the question of landing seems to be a problem which is as yet unsolved. In America the devices for this purpose consist of lines which are strung transversally across the landing run and are held taut by means of sand sacks. In landing, the airplane catches these lines one after the other and is stopped, while

being guided at the same time in a longitudinal direction. The tests on land are said to have been satisfactory; whether it is possible to land when the ship is tossing and rolling and whether such an extensive apparatus can also be carried on a line ship without interfering with the gun fire or being affected by gas pressure is a question still unsolved. It appears doubtful to me whether in the case of existing planes, which have the horizontal speed of an express train when landing, the question of landing can be so solved that an average flyer can land on board ship without taking inadmissible liberties with the landing run in point of length and construction.

HELICOPTERS

Perhaps the development of the helicopter (an airplane with horizontal propellers supposed to be able to rise and land horizontally) will help, as a landing run is not necessary. The test data regarding this machine is very conflicting. The enthusiasm manifested at the beginning has died out. The main difficulty appears to lie in the deficient stability of this airplane; it also requires more power than the other types, and the danger of falling in case of accident to the machinery also still exists. Work is still being done on this type in France and England, and in any event its further development (although the possibility is greatly disputed) is worthy of attention.

AIRCRAFT CARRIERS

At the present time all the great naval powers are actively engaged in building airplane carriers. The newest types are the Japanese (*Amagi* and *Akagi*) ships of 12,000 tons (according to other statistics 33,000 tons), said to be able to carry 50 airplanes each. The French are converting their line ship *Bearn* (placed out of commission during the war) into an aircraft carrier, and the Americans two of their newest armored cruisers, which, as such, are prohibited according to the terms of the Washington agreement. The Americans also desire to equip all their vessels with airplanes and the necessary gear for landing and taking off. Every line ship shall carry four airplanes on board; i. e., two fighting planes, 1 large artillery observation plane, and a torpedo or bombing plane with a reversible catapult for taking off. It can be safely assumed that the other naval powers will also follow suit.

PRESENT STATUS OF THE AIRPLANE

The importance of the airplane for naval use is evidenced by the efforts made by the naval powers to improve this branch of the service. In 1923 America demanded a budget of $15,000,000 for naval

airplanes and Japan 33,000,000 yen. It is understood that the new English airplanes have a flying radius of 2,500 to 3,000 sea miles, and that a transport fleet of 1,400 airplanes will be built, 120 of which are to be constructed immediately, each one carrying 36 men with ammunition and equipment. Based on the workshop ships which proved so satisfactory during the war, a workshop airplane will be built capable of carrying 3 tons of tools and extra parts. Airplanes which can be used on land as well as water, so-called amphibians, have often been tried out, and for the sake of completeness it should be mentioned that it is rumored that a flying boat which can submerge has also been invented. Germany's hands are tied through the absurdity of the Versailles treaty, and we are not allowed to construct military planes.

AIRSHIPS

The airplane has the same relation to the airship as the torpedo boat to the cruiser. Both before and during the war, the airship underwent such development in Germany that the other nations have not caught up with us even to-day. The only rigid airship (and at present only that type is efficient for naval use) that operates satisfactorily in a foreign navy is the *Nordstern* (now *Mediterranee*) which we had to deliver to France. All the other airships which we had to surrender have fallen the victims of untrained, inexperienced crews. England only began airship construction during the war, but had so little success (although the constructions were modeled on the Zeppelins which were brought down in England) that it was decided in 1921 to abandon the construction of airships altogether. Recently a change has arisen. Private airship service is to be supported. For example, an airship line to India and Australia has been planned, and attention is again being turned to the question of naval airships, as in France and America, since they are sevenfold more effective for reconnaissance work and two-thirds cheaper in construction and operation than small cruisers.

In spite of several accidents, the United States has built a rigid airship and has ordered a Zeppelin in Friedrichshafen.

The airship is superior to the airplane principally as regards operative safety, as it can float even when the machinery is out of order; and having six to eight motors, several can be very easily repaired if necessary during a flight. The landing is free from danger, the crew have better accomodations, the flight radius and carrying power are also much greater, because the machine performance is used mainly for propulsive purposes and not, as in airplanes, to keep the ship afloat. The World War has shown the endurance of the German Zeppelin. The flight of a splendid ship from Bulgaria to Khartum and back without any intermediary stops (8,500 kil-

ometers) even to-day is a record. The Zeppelin which we are building for America (70,000 cubic meters) has an engine performance of over 2,000 horsepower, a speed of 130 kilometers per hour, and with a fuel supply of about 20 tons has a flight radius of 5,100 kilometers which at a speed of 100 kilometers increases to about 9,500 kilometers. Even larger is the Schütte-Lanz airship planned for America—100,000 to 150,000 cubic meters, with a length of 275 meters and a diameter of 35 meters, a crew of 50 men, and a carrying capacity of 90 tons.

The airship can also throw many more bombs than the airplane and can also shoot, as by changing the speed it can stop over the target, which is impossible for the airplane. On the other hand, its size makes it an admirable target for the enemy artillery, and on account of the lower speed and maneuverability as compared with the airplane, is an easy victim of the enemy fighting plane. As protection against this, efforts have been made to take several airplanes along which can take off and land on the airship. The English endeavor to combat the airship's inflammability by giving it a double envelope filled with noninflammable gas—in other words, a gas armor—while the Americans use the noninflammable helium to inflate the envelope. The cost of such a ship is considerable. The *R–38*, built in England for America and destroyed during trial flight, cost $2,000,000, while an airplane costs $50,000. It therefore is not a cheap weapon against line ships, and its principal tasks will be reconnaissance and antisubmarine work, for which it is most admirably suited.

HITTING POSSIBILITIES OF AERONAUTICAL BOMBS

This is a very important question. Detailed information regarding the modern bombing and sighting apparatus is naturally a secret of the naval powers in question. However, a few results of bombing tests have been made public. Tests were held in America in the summer of 1921, with the following results:

	Per cent
Against stationary ships	[1] 5–30
Against a moving torpedo boat	11
Against an old line ship directed by wireless in zig-zag course	2½
Against an area on land the size of a new armored cruiser	22

In the tests at sea the flight altitude was from 400 to 1,000 meters; in the land tests, 1,800 meters—too low to get sufficient penetrative energy against an armored target.

In the English tests the following year with the old line ship *Agamemnon*, also steered by wireless in zig-zag course at 10 to 15 knots, there were 3 per cent hits (other statistics gave 7 per cent)

[1] Dependent on the size of the target.

from an altitude of 2,400 meters. But, of course, all this was under peace conditions. The thing that was lacking above all was the enemy antiaircraft artillery and planes.

In fights between line ships, the gunners stand behind heavily armored walls and doubtless have a feeling of safety against enemy shells, even though they may not have such in actuality. The command of the entire artillery rests in the hands of a man who is naturally very carefully selected and especially well trained for his duties, while the duties of the gunners are more mechanical in nature. The flyer is wholly unprotected. In landplanes there is a light armor which affords limited protection against machine-gun fire but not against artillery. Every hit can mean death away up there in the air. It can be understood that all these factors have their influence on the flyer and affect his performance, especially since, owing to the large number of airplanes necessary for an attack, the average flyer will naturally not have the qualities of a first-rate artillery officer.

AIRPLANE AGAINST LINE SHIP

If a correct picture is to be formed of the possibility of hits, then, as already mentioned, not only must the direct hits be considered but also the bombs detonating in the water, the number of which, judging by the American land tests, can be assumed to be equal to the actual hits. If the English tests are taken as a basis, in which the airplanes had at least approximately war altitude, and the 7 per cent figure is taken, then under peace conditions there are about 14 per cent hits on and close to the target during especially good weather and with a slowly moving target. If under serious conditions about one-half this figure is taken and it is provided that an airplane only carries one bomb and that four bomb hits are necessary to destroy a line ship, then about 60 airplanes are necessary for a successful attack, provided, of course, that none of these is prevented from throwing its bomb by the enemy antiaircraft.

It need not be mentioned that the above computation is in no way absolute, and with other provisos results in quite other figures. Nevertheless it shows that an appreciably large number of airplanes must be used if not merely accidental successes are to be attained. In order to be able to direct such a number of airplanes on a squadron on the high seas, then there must be a considerable number of airplane carriers. The largest at present apparently can carry 50 planes, but these could scarcely all be ready for use at the same time. For the destruction of a line ship it amounts approximately to the fact that there must be a fully equipped aircraft carrier, which, on account of the large size and high speed necessary, must have about the same displacement as the line ship.

AIRPLANES IN COAST PROTECTION

The quantity of airplanes necessary for combatting line ships can start off much easier from a land station, and a line ship squadron having only a very limited air force will therefore keep away from a coast defended by aircraft. Aircraft in this case, therefore, fulfills the same purpose as the small torpedo boats—it strengthens the coast defenses.

FUTURE DEVELOPMENT OF THE AIRPLANE

The future development of aircraft can not at present be foreseen. Without a new invention in the province of motors which will put everything on a new basis, decided improvements are improbable. It is possible that, inspired by the success of gliding flight and up to the time of further improvements in the motor, efforts will be made to increase the flight properties through improvements on the plane itself instead of, as formerly, through the machine performance which increased the weight of the plane. The question of the helicopter has already been discussed.

AUTOMATIC DIRECTION

A torpedo or airplane attack on a battleship involves an extraordinary amount of cold-bloodedness and scorn of death owing to the enemy's tremendous counteraction. This has led to an attempt to direct vessels and aircraft by wireless. The Germans used boats of this kind successfully on the Flanders front during the war. According to newspaper reports, England has recently built such boats, filled with a powerful explosive charge, which are then directed on the enemy by wireless (like a gigantic torpedo) from a safe distance. The Americans have gone a step further and have built airplanes according to the same principle. The details are kept secret; it is merely reported that they have installations and devices enabling them to fly automatically about 6 meters over the surface, that they are apparently difficult to hit, and through the countercurrent existing at this height they can be automatically held in their position. In Italy a telebomb is said to have been constructed which, during the test at an altitude of 3,000 meters, was thrown at a distance of 10 kilometers from the target, and after a short plunge glided along until it reached the target; it then took a vertical direction and struck the target with great force.

Whether the development of all such things will have the success claimed by their enthusiastic promoters is an open question.

The automatic agent must always remain in sight of its human director, and it is against the latter that the counteraction will be directed.

COST OF LINE SHIPS AND AIRPLANES

The principal argument against the line ship is its greater expense as compared with the airplane. It is estimated that a substitute for the *France* will cost 250,000,000 francs, while the *Hood* cost over 6,000,000 pounds sterling. In America a line ship costs from $30,000,000 to $40,000,000 and an airplane only $50,000; 600 to 800 airplanes could therefore be built for the price of one line ship. On the other hand, however, a line ship lasts about 20 years, while an airplane only lasts about 2 years. We have seen that about 60 airplanes are necessary for a successful attack on a line ship; therefore, reckoning 20 years, about 600 airplanes. If we consider that the necessary reserve planes must also be added to this number, then the actual cost of a line ship and the equivalent number of airplanes is approximately the same, exclusive of the cost of the airplane carrier. The crew of a line ship will amount to about 1,500 men, that of the airplanes only about 300, but added to the latter must come the crew of the airship carrier, or the land crew (the Americans estimate 20 men per airplane), so that there is no saving in personnel. The costs of repairs and land plants, docks, and yards, on the one hand, and hangars, landing courses, and repair shops, on the other, will about even up. Therefore the substitution of airplanes for line ships does not mean any economy in naval armament.

CONCLUSION

The idea that submarines and aircraft mean the end of the line ship is not borne out by the above. Both are dangerous adversaries of the line ship, but the damage they can do to the latter is overvalued on the basis of their initial successes or test results under peace conditions, while one is inclined to underrate the defensive possibilities of the line ship, which only actually comes to the fore in service conditions. Submarine and airplane are to-day fairly new and therefore are not perfect and are still capable of development, but the fact is also true of antisubmarine and antiaircraft defense. Every improvement in offensive brings a corresponding improvement in defensive, as is repeatedly shown in the history of naval technique. We can agree perfectly with the official American report of the bomb tests in the summer of 1921, stating that the airplane as well as the submarine, torpedo boat, or mine has increased the danger to which the line ship is subjected. Instead of creating an inex-

pensive weapon, resulting in the abandonment of the expensive line ship, the airplane has only made warfare more complicated. The line ship is still the backbone of the fleet and the bulwark of naval power and will remain so as long as the safeguarding of merchant vessels and transports is a decisive factor in warfare.

DEVELOPMENT OF THE LINE SHIP

We will now consider briefly the future development of the line ship. The main efforts will continue to be directed toward discharging large explosive masses from the greatest possible distance, and even though the caliber is limited to 40.6 centimeters, there is no limit to the improvement of the power of penetration and the firing radius. The bottom must be better protected against torpedoes and the upper part of the ship against armor-piercing bombs. Also the sharp angle of incidence of shells demands a better horizontal protection, considering the great distance at which battles are fought, which will probably be increased even more in the future. The factor of speed, whose value is thoroughly recognized in warfare, will also be increased. However, if artillery horizontal protection and speed are to be improved while keeping to the 35,000 tons displacement decreed by the Washington conference, then it can only be at the expense of the vertical armor. It is questionable whether the thickness or extent of the armor will be decreased. America is inclined to the first, England to the second; probably both will be necessary, and the question must be considered as to whether the present system of armament which lays more stress on the vertical than the horizontal protection, is the correct one.

The weakening of the vertical armament, even as the improvement of the gun, forces an increase in the fighting distance. As the firing range of the 40.6-centimeter guns is already 36 kilometers—that is, beyond the range of vision—indirect firing (directed from an airplane) from one moving ship against a moving opponent scarcely promises success, and one can easily fancy the line ship no longer discharging its shells through its own artillery, but by means of an airplane flying to the enemy probably as an automatic agent directed by wireless from an airship or airplane, discharging the torpedoes or bombs, returning to the line ship, taking on new explosives and resuming operations—a method of fighting similar to present-day artillery fire. The airplane mother ship would therefore become the line ship of the future, which would probably not be altogether undesirable to many of the fathers of the Washington conference. As already said, the development of the airplane, the taking-off and landing devices, has not progressed so far that it becomes a thing

to be reckoned with in the near future. However, this is by no means out of the question. But in spite of everything the new ship will still be a line ship, only with modern weapons, as to-day.

UNITED STATES

NAVAL STRATEGY AND TACTICS, WITH SPECIAL REFERENCE TO SEACOAST FORTIFICATIONS

[Portions of a lecture by Commander W. S. Pye, United States Navy, given at the Army Engineers School, Fort Humphreys, Va., April, 1924]

Peace strategy is largely controlled by our statesmen and Congress, but Army and Navy officers are responsible that the needs of the Nation in the matter of military and naval preparedness, as recommended to Congress, are sound and within reason in the amount of expenditure entailed.

Too often for the good of the country our experts disagree on our military and naval needs. We become so interested in our own branch or service that we are prone to accentuate its needs and by so doing, perhaps unwittingly, detract from some other branch or service the importance it justly deserves.

It is therefore essential that in these days of economy we all conscientiously study the relation between the Army and Navy and the various branches of each in order to ascertain the proper relationship which exists and the proper precedence to be given their respective needs, with a view to attaining the highest efficiency in the prosecution of such wars as the conflict of our foreign policies with the policies of other Nations may indicate as probable.

Long steps in advance in this direction have been made by the addition of the joint planning committee as a working committee for the joint board; by frequent attendance of the officers of one service at the various schools and war colleges of the other service and by lectures, and last, but by no means least, by the formation of joint war plans.

It is not my intention to discuss these joint war plans, but I do desire to point out that the fact that joint plans exist indicates that for certain possible situations the War and Navy Departments have reached a common decision as to the governing concept of such possible wars and, consequently, the recommendations of the two departments to Congress in the future will be much more harmonious.

With the idea in mind that more and more in the future must the opinions of our experts who give advice to Congress be based upon a common conception of the relation and interrelation of the branches and services of the national defense, I desire to indicate for

your consideration my opinion of the relation from the naval point of view between the coast fortifications and the Navy.

By coast fortifications I mean defenses consisting of guns, mortars, and controlled mine fields. It is irrelevant to this discussion whether the guns shall be mounted on fixed emplacements or be mobile provided the characteristics later mentioned are incorporated.

In the relation of coast fortifications to naval strategy it is desirable to consider two aspects: First, their importance to a fleet operating upon the strategical offensive; and, second, to a fleet operating upon the strategical defensive.

In order that there may be no confusion of ideas in relation to the meaning of these terms, strategical offensive and strategical defensive, I will explain my conception of them.

A fleet is operating on the strategical offensive when its operations are projected into an area: (*a*) Which is not normally controlled during peace; (*b*) which has not been previously prepared for defense.

A fleet is operating on the strategical defensive when its operations are confined to an area which: (*a*) Is normally controlled during peace; (*b*) has been taken from the enemy and prepared for defense.

The mission of a fleet is to gain and maintain command of all vital lines of transportation, both our own and the enemy's.

Because of the need for fuel and repairs no fleet can operate for a long period of time without a base, and such base or bases must be so located that the fleet can operate continuously in the vicinity of the enemy's major naval forces and lines of transportation or in the area to be controlled.

The inability of a fleet to operate effectively without bases has a determining influence upon the nature of a naval campaign. In general, campaigns to secure command of the sea are of one of the following types:

(*a*) A campaign in which both opposing fleets operate from their home bases.

(*b*) A campaign in which one fleet operates from its home bases or temporary bases in the general vicinity of its home coast, while the other fleet crosses the sea to operate from bases in the same locality, which bases were during peace under the sovereignty of the nation whose fleet is crossing the sea and which may have been more or less prepared for such activities.

(*c*) A campaign in which one fleet operates from its home bases or temporary bases in the general vicinity of its coast, while the other fleet crosses the sea, takes up a position, improvises bases, and operates in an area adjacent to the enemy coast.

Because of the great distances separating the United States from the territory of any nation having sufficient naval strength to contest with our Navy for command of the sea, a campaign of the first type is impossible for our Navy. The operations of the British and German Navies in the World War form an excellent example of this type of campaign.

The second type of campaign is one which would be presented should our fleet be required to operate offensively in the western Pacific based upon Manila Bay or Guam, or defensively in the Atlantic against the fleet of a European nation having bases near our coast.

This type of campaign is illustrated in history by the campaign of the Spanish squadron under Cevera and the Russian fleet under Rodjesventski. Historically such campaigns have resulted in the defeat of the strategically offensive fleet, but these results were due largely to the failure of the peace strategy of the nations whose fleets were defeated. Such peace strategy failed to provide adequate bases or fleet sufficiently superior to justify strategically offensive operations.

An example of the third type of campaign can not be found in modern naval history, yet should we lose our bases in Manila and Guam our fleet would be forced to conduct such a campaign in case it was required to operate in the western Pacific.

A marked superiority is an essential condition to the conduct of offensive strategy. Naval superiority is usually determined by a consideration of relative numbers and characteristics of ships, but this comparison is a just one, even solely from a material point of view, only when the two fleets can operate from equally well-appointed bases within the immediate theater of operations.

Bases to be of service to the fleet must not only be adequate to its needs in their equipment for repairs, refueling, etc., but they must be defended so strongly that the fleet may operate unhampered by the necessity for considering the safety of its bases.

The Army is charged with the defense of all bases in the continental United States and all permanently fortified bases in our island possessions.

If this defense is adequate the possession of such bases greatly strengthens the fleet; if inadequate, such bases may be a source of weakness.

In what ways do well-defended bases in our outlying possessions strenghten the fleet?

First, and perhaps the most important, they increase the mobility of the fleet.

Second, they add to its radius of action.

Third, by affording a position for fueling and repairs they add to its available strength.

Fourth, they assist its operations by furnishing information which can be derived from enemy action or nonaction in their vicinity.

Let us consider these points in greater detail.

First, mobility.—The mobility of the fleet is dependent to a large extent (*a*) upon how many auxiliaries must accompany it; (*b*) upon the location of bases from which it may draw essential supplies; and (*c*) upon the location of bases in which essential repairs may be effected.

A well-equipped and adequately defended base in the Hawaiian Islands will permit our fleet to concentrate there and save 2,000 miles in a journey to the western Pacific.

If there are no bases farther to the westward which are adequately defended and equipped, our fleet must delay in Hawaii until we have concentrated a sufficient number of tankers and various other auxiliaries to provide for its needs, and when it does move to the westward its mobility will be restricted by the slow speed of the train and the necessity for securing its safety.

If Manila Bay were properly defended and equipped, our fleet could proceed from Hawaii immediately, and consequently such a base would reduce the time of arrival of our fleet in the western Pacific by a period of at least one month. This period of one month might be vital to winning the war.

An adequately defended and well-equipped base in Manila Bay would, therefore, add materially to the mobility of our fleet.

How does the possession of bases affect the radius of action of the fleet?

In its strictest sense the radius of action of the fleet depends upon its fuel capacity, but as ships can be refueled with facility only in defended bases it is apparent that a base in the area of operations actually has the effect of greatly extending the radius of action of the fleet.

A base in Manila Bay is so much nearer to the area in which the major activities of our fleet would be carried out that this base, even as compared to Guam, would have the practical effect of extending the radius of action of the fleet by nearly 1,000 miles.

How does the possession of bases affect the available strength of the fleet?

The distance steamed from our base to the vital operating area and a line distance steamed in return for fuel or repairs is actually wasted effort. If this distance to be steamed was such as to require the expenditure of one-half of the fuel of the ship, it is plain that the portion of the fleet which could operate continuously in the vital area would be seriously reduced.

Bases in the vital area therefore decrease the time units of the fleet must be absent for fuel or repairs, and consequently have an

enormous effect in increasing the available strength of the fleet in the decisive area.

I have dwelt at some length upon the vital effect of well-defended and adequately equipped bases to a fleet operating upon the strategical offensive for two reasons: First, the value of such bases to the fleet is constantly overlooked by many in comparing fleet strength; and second, because these bases are the primary points of contact between the Navy and coast fortifications.

In the operations of a fleet on the strategical defensive bases may also play an important rôle, but the defense of such base is not so essentially coordinated with naval operations. The necessity of defense for commercial and economic reasons is very important.

It so happens, however, that the ports which are of the greatest commercial and economic importance are likewise of greatest importance to the Navy because of the naval facilities at those ports.

The defense of ports on our home coast is, however, more closely allied to the problem of general defense of the coast than is the problem of the defense of outlying or insular bases.

The strongest and most effective weapon for coast defense is a superior fleet preferably operating upon the strategical offensive. But as we can not always be sure of such superiority, we should provide bases in which the fleet, or portions of it, may seek security for refueling or refit, and also our ports must be secure from attack even if the fleet through force of circumstances is operating in another theater of operations.

It will be seen from the above discussion that the location of permanent coast defenses within the continental United States has practically been determined for us by the natural development of the Nation, whereas the erection of defenses in our outlying possessions should be governed primarily by a consideration of national policy and consequent naval strategy.

On account of the recent international treaty no increase in permanent fortifications can be made in our island possessions in the Pacific west of the Hawaiian Islands during the continuance of such treaty.

We have now, therefore, a number of years to study the probable development of the world before deciding upon our future course of action. These years must not be wasted. The nation which has made the best estimate of the situation will be the big gainer when nations again sit around the conference table.

The Army and Navy must coordinate their ideas and actions in order that when they are called upon for advice as to what changes should be made in the treaty to better assure our national defense the recommendations may be approved by both and be based upon a

common understanding of the relation between the functions of the two services and their various arms.

From the point of view of tactics the relation between the Navy and coast fortifications may best be determined by a consideration of the employment of the weapons of such defenses in conjunction with the units of the fleet, and their employment when the fleet is not present.

So long as our undefeated fleet is operating near our own coast it is improbable that any serious attack will be made upon our ports and bases, except in the nature of minor raids by cruisers or submarines or by aircraft.

If our fleet should be defeated in a major action it is possible that an enemy fleet might attempt to bombard some of our important seacoast cities, but such bombardment to-day would be more effectively made by aircraft.

There can be no denying the fact that aircraft have materially reduced the value of coast fortifications. Fortifications have no mobility. Aircraft, within their radius of action, have the greatest mobility of any service.

Perhaps the best way to determine the relation of coast fortifications to naval tactics is to consider, first, the methods of attack by naval units upon coastal areas; and, second, the methods by which coastal fortifications may assist our naval forces in a tactical sense.

In the pamphlet Joint Army and Navy Action in Coast Defense the forms of attack on the seacoast which may be anticipated are stated as follows:

(*a*) Aircraft attacks on seaports.
(*b*) Mine-laying attacks off the seacoast.
(*c*) Torpedo, bombing, and gunfire attacks on vessels off the seacoast.
(*d*) Torpedo fire into seaports.
(*e*) Blocking attacks on seaports.
(*f*) Bombardment of seaports by naval vessels.
(*g*) Penetration into a harbor or water area by naval vessels.
(*h*) Landing attacks.

In what respect and to what extent are coast fortifications concerned in defense against such attacks?

First. Aircraft attacks on seaports.—As aircraft attacks on seaports can only be delivered from airplane carriers or from air bases on shore, the coast fortifications can not prevent their initiation unless the aircraft carriers should come within range of its guns.

Such an assumption is untenable.

The Navy, or mobile forces of the Army, must prevent the initiation of such attacks.

The coast fortifications should be concerned with such attacks only in so far as local defensive action is concerned, but for this purpose should have adequate antiaircraft defense to prevent destruction of the fortification by enemy aircraft.

Second. Mine-laying attacks off the seacoast.—Defense against mine laying except in the immediate vicinity of the fortifications is a naval mission. The coast fortifications, of course, have a mission to prevent such activity within the area controlled by their armament.

In order to prevent such operations and to prevent sweeping of defensive controlled mine fields there should be an adequate armament of 5-inch or 6-inch guns, mobile or fixed, depending upon the size of the area open to such operations.

Third. Torpedo, bombing, and gunfire attacks on vessels off the seacoast.—The defense against such activity is also primarily a naval mission, but the batteries of coast fortifications give protection to all vessels attacked if they are able to reach the area controlled by its armament.

The value of fortifications for this purpose is insufficient to justify expenditure of large sums of money for this duty alone. But all armament of a fortification should be used to assist shipping so far as it is practicable.

Fourth. Torpedo fire into seaports.—The Navy should prevent any enemy vessel reaching a position from which such torpedo fire would be possible, but should an enemy ship reach such a position within the range of coast fortifications the armament of such fortification should of course be used.

Batteries which cover the mine field area should in most cases be suitably disposed to counter such an attack.

Fifth. Blocking attacks on seaports.—Attacks of this nature consist of sinking vessels in a channel to obstruct it. Should such vessels reach the area covered by the armament of the coast fortifications such armament should be used. Fortification of areas for this specific purpose can not be justified.

Sixth. Bombardment of seaports by naval vessels.—Until the development of aircraft the defense against bombardment from naval vessels in the absence of naval forces was solely a mission of the coast fortifications. To-day the aircraft of the Army and Navy are seriously threatening the dominance of coast fortifications even in this respect.

In the vicinity of our home coast, where air superiority is practically sure to rest overwhelmingly with the defense, it is very doubtful if any enemy would expose major ships, or in fact any ships of importance, to air attack for the purpose of bombarding seaports.

In an attack on an outlying base the conditions are different. In this case it is possible that the attacking force might have an equal or superior air force.

Also, the destruction of an outlying base might have a decisive effect in forcing a modification of naval strategy. In all operations of war the risk must be balanced against the anticipated gain. It is not believed that the gain from bombarding ports on our coast would be sufficient to justify any nation in using its major or other important ships in a bombardment where local control of the air can not be challenged and where successful bombardment would result only in local damage.

Seventh. Penetration into a harbor or water area by naval vessels. Eighth. Landing attacks.—These two may be considered together, for they bear much the same relations to coast fortifications.

Penetration into a harbor or water area would ordinarily be attempted only to obtain a position out of range of fortifications for the purpose of bombardment or for landing operations.

A consideration of this subject usually leads to a consideration of the Dardanelles campaign. While it is true that the coast fortifications did prevent the penetration of the Dardanelles, we can not consider that campaign a standard for future development.

The Turks had practically no navy, and their aircraft were not efficient. It is most doubtful if a fleet will ever again attempt to pass into the Dardanelles without complete control of the air.

One of my friends, upon reading this paper, when he got this far said: "This reminds me of a man giving a Christian Science lecture at a medical school." I don't doubt but that it appears much the same to you, but perhaps when we consider the defense of naval bases we will have a better idea of my final conclusions.

I have omitted a discussion of the benefit of coast fortifications to a fleet in making a sortie from port, because in the case of a fleet operating on the strategical defensive there should never be a time when the fleet would be caught in port, and likewise because it is doubtful if an enemy fleet could come close to our coast until our fleet had been defeated. This subject will be considered, however, in connection with outlying bases.

The relation between coast fortifications and outlying bases is much more vital, and a relation which has been overlooked in the past because of the lack of strategic foresight.

The value of bases to the Navy has been mentioned. Their defense is vital. In what manner and for what cause are coast fortifications more important at such bases than on our home coast?

It has been pointed out in the previous discussion that the decrease in importance of coast fortifications on our home coast has been due

to the increased efficiency of aircraft and to the fact that we should always have a marked superiority in such craft in operations off our home coast, and that our information service should now permit us to locate enemy units in sufficient time to concentrate the available naval force to engage the enemy out of range of the guns of coast fortifications.

This superiority may not exist in operations in the vicinity of outlying naval bases. We should, it is true, have sufficient air force to contend for control of the air with any air force which the enemy can bring to the vicinity in carriers, but we can not hope to have such superiority that an enemy fleet can be destroyed by aircraft alone.

Furthermore, as the destruction of a base might change the entire strategy of a war, bases must be so thoroughly defended that there can be no question as to their safety up to the time the fleet arrives.

In localities where control of the air may not rest with the force defending a base, or where the air forces may be so nearly equal as to make them negligible in determining the result, coast fortifications of the strongest possible type are absolutely essential.

It was pointed out that in operating from our home coast there should never be a time when our fleet should be caught in port and have to make a sortie in the presence of the enemy.

Such a sortie in the presence of the enemy may have to be made from an outlying base or from either entrance to the Panama Canal.

In making a long passage to an outlying base our fleet might so nearly expend its fuel as to require refueling before it could advantageously engage in a major action. The defense of such base must therefore provide protection against bombardment of the base and harbor and, in addition, control by gunfire over such areas at the entrance to the port as would permit the enemy to engage our fleet at a disadvantage during its sortie.

The battleships of the fleet in proceeding to sea will usually be required to steam in column formation until clear of narrow channels or narrow openings in mine fields or antisubmarine defenses.

In this formation gunfire can not be developed. If the enemy can take up a position across the course of the battle line, he will obtain a tremendous tactical advantage. To prevent the enemy attaining this position of advantage is one principal function of the major-caliber guns of coast fortifications.

This function requires that the major-caliber guns of the coast fortification shall have the maximum possible range and shall be emplaced on such salient points that the enemy battleships, in seeking a position of advantage with regard to the battleships making the

sortie, will be forced to enter the area within effective range of such coast fortifications.

If the coast fortifications are to be really effective, they must be of sufficient strength to make an enemy unwilling to place himself within effective range of such fortifications to gain the tactical advantage over the fleet making the sortie.

Coast fortifications at each end of the Panama Canal should be of this same nature. Our fleet may be required to pass through the canal and debouch in contact with the enemy. Coast fortifications must prevent the enemy fleet from engaging our fleet before it can take up battle formation.

This, then, is the modern rôle of coast fortifications in which they have a close relation to naval tactics.

In the past we have thought more of the coast fortifications on our coast than we have of those in our outlying possessions. To-day, because of the relative strength of our fleet and the effectiveness of aircraft, we should abandon fixed coast fortifications on our home coast, except in the vicinity of our principal ports, and use our appropriations to develop the coast fortifications of the Panama Canal and Oahu, and in the future should erect fixed fortifications only in defense of outlying naval bases and main seaports which can be bombarded from the sea.

In a few words, my opinion may be summarized as follows:

The best coast defense is a strategically offensive fleet.

Strategically well-situated bases are essential to the operation of our fleet. Such bases add to the mobility, radius of action, and available strength of the fleet.

Outlying naval bases must be securely defended. The defense must provide against—

(1) Bombardment by an enemy fleet.
(2) Attacks from the air.
(3) Attacks by minor elements of the enemy fleet using torpedoes and mines.
(4) Landing attacks.

To perform its task effectively the defense of such a base must comprise:

(1) Sufficient air force to control the air against such enemy air force as may be carried by enemy ships.
(2) Major-caliber guns so emplaced and with sufficient range to prevent the bombardment of the harbor area or base facilities by enemy ships, and to control sufficient area off the entrance to deny to an enemy fleet a position from which it can attack our fleet while it is making a sortie.

(3) Minor-caliber guns to prevent enemy torpedo craft operating in the vicinity of the entrance and to oppose landing operations.

(4) Controlled mine fields in suitable areas from which enemy major ships might operate to advantage.

Let us not forget that when war is upon us it is too late to construct defenses. Coast fortifications are weapons of peace strategy. Unless the Army and Navy work in harmony to obtain the proper defenses for our naval bases and the Panama Canal, war will find us unprepared.

In our consideration of peace strategy let us not forget our terse definition: Strategy is when and where to fight.

Where is dependent upon our national policies and conflicting policies of foreign nations. We must be far-sighted in determining the trend of these policies in order that we may know the probable areas of future conflict. Having determined these we must provide adequate permanently defended bases for our fleet.

When is dependent upon two major considerations: First, only when our interests are threatened to such an extent as to justify war; and, second, only when we are prepared.

Adequate foresight is the greatest weapon of peace strategy. Its greatest victories, those won without a fight.

Our statesmen make for us the decision as to when to fight. Let us hope that they may so prepare this Nation both from a diplomatic and military viewpoint that should the time arrive the Army and Navy may be prepared for their task.

Although Congress is responsible for the authorization of appropriations for coast defense, we can not blame them for failure to provide if the Army and Navy can not agree on what is most needed for our national defense.

I have tried to express my opinions frankly, for it is only by so doing that we will be able to reconcile the various points of view. My hope is that the importance to the Navy of coast fortifications for the defense of our outlying bases may henceforth have a more important place in your consideration of peace strategy.

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OFFICE OF NAVAL INTELLIGENCE
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MONTHLY INFORMATION BULLETIN

NUMBER 8—1924—AUGUST, 1924

FOR CONVENIENCE IN ROUTING

Officer	Initials	Date received	Date forwarded
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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H. M. S. HOOD

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BRITISH SPECIAL SERVICE SQUADRON APPROACHING HONOLULU

GREAT BRITAIN

SINGAPORE NAVAL BASE

July, 1924

Herewith are presented the latest facts and opinions in connection with the Singapore naval base.

The decision of the Labor Government of Great Britain to abandon the Singapore naval base scheme has, as is well known, aroused a bitter controversy, not only in the Lords and Commons, but throughout the entire British Empire. The feeling ran high in Australia, New Zealand, and Singapore.

Having spent three years in Singapore and having followed this subject rather closely, as well as having come in contact with many persons in authority well able to advance an opinion both in Singapore and England, it is thought that an analysis of the situation might be of special interest.

Primarily what object has Great Britain in view in establishing this base? At a moment when the Empire's finances are being strained almost to the breaking point a nation does not vote to expend the sum of $50,000,000 on naval defense unless it is considered absolutely necessary. This is especially the case when one realizes that Singapore is 9,000 miles from the shores of England. The reason is apparent. The constructive politics of the future are reared upon the substructure of experiences gained in the past and of such experiences Great Britain has had plenty. Such experiences, in fact, have formed the precedent and procedure which have guided English statesmen in piecing together the greatest colonial empire known in history. There have been times in British history when the Government has decided on quick policy changes which have been instrumental in bringing about far-reaching results. Such policies were always instigated by the feeling of self-defense. For example, as far back as 1902 when Chamberlain was Colonial Minister the British Government attempted to come to some understanding with Germany in regard to limiting naval construction. It is claimed that even an offer of an alliance was made. Germany refused, and Great Britain, emerging from her rôle of splendid isola-

tion and the three-power naval standard, broke with all precedent and formed an alliance with Japan. The immediate and far-reaching result of such action was the advantage which England gained by being free to concentrate her naval forces in the North Sea. From that time on Germany was the enemy.

In this world one lives on the logic deduced from comparisons, and if there is anything in analogy one may take for granted that what has happened before is rather certain to happen again, providing conditions are such as to create the analogy in any given thing. This is especially true in the trend of human history. In 1902 England felt her interests threatened by Germany. To-day she feels the same danger from Japan. Hence the analogy between the necessity in 1902 for the naval base in the North Sea and the present need for a similar base in Singapore.

There is one cardinal point which must always be borne in mind. It is this: The British Empire is actually an Asiatic empire. Sixty per cent of its interests lie east of the Suez Canal. With the exception of the trade of the Dutch East Indies, it may be said that the waters which lave the shores of Hongkong, Malaya, India, and Australia practically form a gigantic inland sea for British shipping and commerce. And it is just this part of the world which offers the best prospects for British markets in the future.

It is an undeniable fact that during the past 25 years a new power has arisen in the Far East which has succeeded in obtaining complete control of the western Pacific. Japan is now encroaching largely upon the trade of Great Britain in the area just described. There appears good reason to believe that Japan now aims at the mastery of the islands and continents of the southern seas.

The fundamental conception of the Singapore base is aimed to offset the expanding influence of Japan which has never made any secret of its aggressive policy and need of new territory for political and commercial expansion.

Probably there has been no time in history when the political aspect and commercial aggression have been so interwoven as in the present prospective eventual conflict.

During the past twenty years European and American prestige has become seriously impaired in the Far East. As far as Japan was concerned, the idea of white inferiority began to take root even before the end of the Russo-Japanese war. In 1904 the Pan-Asiatic Association was founded, and it was soon followed by the Indo-Japanese Association. The societies were established by Marquis Okuma, who went on record as stating that India was oppressed by Europeans and Japan should go to its assistance. Mr. Hara also preached the doctrine of the white peril to the Far East. Both these men became in turn prime ministers of Japan. It was during the

World War, when the hands of the Allies were tied, that Japan presented to China the famous 21 demands, which, if they had been granted, would have given to Japan an almost complete military and economic control in China. Thus far the failure of Japan to obtain a foothold in Siberia may easily be accounted for. In the first instance, Siberia is too cold for the Japanese. It is true that small shopkeepers might settle in the little towns of eastern Siberia and the maritime Provinces and become prosperous, but the climate is too cold for them to become farmers. When Japanese troops were stationed in Siberia during the winters of 1918, 1919, and 1920, many sentinels froze to death at their posts. On account of climatic conditions, the Province of Yezo, in the extreme northern part of Japan, is very sparsely populated. The climate of Siberia is even more rigorous. The Japanese have obtained a foothold in Manchuria, and undoubtedly one of the cherished schemes of Japanese statesmen is to enlarge the sphere of influence in China. But China is a densely populated country, and the Japanese in their colonization enterprises go along the lines of least resistance; hence the attempt to find an outlet for the overflow population in Brazil, Mexico, and California. Japanese shopkeepers have already deeply penetrated Hawaii, the Philippines, and Malaya. In the city of Singapore alone there are 6,000 Japanese, or as many as the total white population combined.

Speaking of the patriotic societies which were formed in Japan with aggressive political programs for dominance in the Far East, it is easy to review the attitude which Germany adopted 25 years ago. It was during the Spanish-American War and the South African war that Germany founded the All Deutscher Verband and the Flottenverein, all of which largely contributed toward bringing about the World War by poisoning the minds of the German people with false and insidious propaganda.

There is one thing which must not be lost sight of. Japan is animated by perfectly legitimate ambitions. New territory is necessary for economic and commercial expansion. I heard a very characteristic speech two years ago by the Japanese consul general in Singapore. It was on the occasion of an attempt to establish in this city a chapter of the League of Nations. He said:

> Japan has been accused of being a warlike nation. This is untrue. When the World War broke out in 1914, Japan endeavored to remain neutral, but England forced us into it on account of the alliance. * * * Japan is an overpopulated nation. The need for expansion is apparent. We look about us and see great islands thinly populated, with climatic conditions suitable for settlement. * * * Japan will expand even if it is necessary to fight. We are more interested in league of color than we are in a League of Nations.

The last sentence was vociferously applauded by all the Japanese, Malays, and Hindus present.

As in all other countries, the cost of living rose in Japan during the Great War, but wages did not rise proportionately. This led to labor unrest and Bolshevik propaganda. Japan is greatly in need of raw materials as well as foodstuffs. Cotton, oil, coal, and iron are essential; otherwise Japan can not remain a great manufacturing and military nation. These things Japan intends to have; and China, the Philippines, the Dutch East Indies, and Australia are the adjacent countries which can produce them. The annual increase in population in Japan amounts to 700,000. The area for planting rice can not be increased. This is why Japan casts longing eyes to the Philippines, where the population is 87 to the square mile; to the Dutch East Indies, where, apart from Java, the population is 20 to the square mile; to French Indo-China, with 60 to the square mile; Siam, with 34; the Malay Peninsula, 75; and Australia, with scarcely 2 to the square mile. The density of the population in Japan is 375 to the square mile, and parts of the country are mountainous and volcanic in character—quite unhabitable.

English naval authorities have estimated that the Japanese naval shipbuilding program has only been held up one year on account of the earthquake, and that during this year of 1924 $10,000,000 will be spent on naval bases and fortifications. Did it ever occur to the department that this is the amount that the American people voluntarily contributed to help the earthquake sufferers in Japan?

Most of the British oversea dominions have protested energetically against the abandonment of the Singapore base. It is but natural that sentiment in Singapore should be very pronounced. However, feeling here is that the decision is not final. One very prominent man here said the other day: "If I believed that the decision was positive and final, I should say, very gravely indeed, that the first nail had been driven in the coffin of the British Empire." The Singapore base is absolutely an imperial issue, and it has been very carefully deliberated upon not only before the committee of imperial defense, but it has also been submitted in detail to the imperial conference.

Apart from the question of military and commercial strategy there is another angle not to be lost sight of when viewing the importance of Singapore as a whole. The island of Singapore will undoubtedly become one of the greatest oil stores in the world. To-day there are probably 50 vast tanks in the suburbs of the city and on the little adjacent islands. In a few years they may be counted by the hundreds. Six thousand ships a year converge on Singapore and then find their way to every part of the world. Oil each year is increasingly becoming the motive power. Under such circumstances can Great Britain leave such an important place unprotected? What would it mean if such a prize should be

attacked by a determined enemy, even before war had been officially declared, as in the case of Port Arthur in 1904?

There is also a feeling of uneasiness in Singapore and the Dutch East Indies at the rapid commercial expansion of Japan. Japanese merchants and shopkeepers are peacefully penetrating every community. A short time ago a new Japanese bank was opened in Sourabaya. At the present moment there is a gathering at Batavia of all the Japanese consular officials in the Philippines, Hongkong, Indo-China, Malaya, India, Dutch East Indies, and Australia. This is the second meeting of its kind, the first having taken place in Singapore just two years ago. There is also considerable speculation concerning the official visit of the governor general of French Indo-China to Japan this year. Ostensibly the question of tariff and immigration are to be discussed. Duties on imported goods into Indo-China other than French practically amount to exclusion. Any mutually preferential agreement would at once arouse opposition in Singapore, which is a free port, with the exception of a nominal duty on spirits, tobacco, and kerosene oil.

It has been hinted by some that France cherishes some deep and subtle schemes in regard to Japan. Those who feel that there is a deep undercurrent of growing antipathy between England and France seem inclined to believe that France would not be disinclined to form an alliance with Japan and occupy the place which England recently held in the old alliance. On the other hand it is felt that any agreement which France might make permitting the entry of large numbers of Japanese into Indo-China would have but one result, namely, political domination. Although France is anxious to develop Indo-China, and the proximity of such a prosperous colony as Singapore urges her forward, yet it is doubtful if her statesmen would resort to an unlimited flow of Japanese immigrants. When in Indo-China two years ago, it was surprising to see the intensity of anti-English feeling on the part of the French. This is caused, it appears, by envy of the more prosperous and undoubtedly better-governed colony of the British Malaya.

The present conflict between the United States and Japan on account of the new immigration bill is being watched with the keenest interest in Singapore. The Japanese consul general has just published in the press the protest of his Government at Washington. In addition to the expense which it must cost the Government of Japan to cable very lengthy telegrams to all the consuls in this area, these consular officials must have large funds for the purpose of carrying on propaganda. In the Singapore press the name of the Japanese consul general appears almost daily in connection with some statement or letter in which he defends Japanese interests or those of the Japanese people residing in Malaya. Malaya is not a

white man's country like Canada or Australia, yet even so the sentiment among the natives is anti-Japanese. Among the British residents there is a strong feeling of race solidarity when it comes to facing the pretensions of Japan, and they have many times expressed the sentiment that the Singapore base was intended for the use of the American Navy in time of need as much as for that of Great Britain.

JAPAN

MISCELLANEOUS NAVAL NOTES

June–July, 1924

(From the Japanese Press)

The naval engineering school which suffered severe damage by earthquake and fire and was moved to Kure in the premises of the naval academy, and this was taken as a step toward the consolidation of the two schools and the ultimate removal of distinction between line and engineer officers.

However, the recent meeting of high officials of the navy which was held in Tokyo, was not in favor of the removal of distinction between the two branches, and this has much displeased the engineering officers, with the result that it has become unwise to continue the present arrangement of schools. It has been decided to again open the engineering school at Yokosuka.

GRAND MANEUVERS OF JAPANESE NAVY

Grand maneuvers, the first since the armament limitation will be held from the latter part of September until the middle of October, with Tokyo Bay as the center, the field of action covering the Pacific, Pascadores in the west and Aomori in the east, the ships participating therein comprising the flower of the Japanese Navy, including two submarine squadrons, two airplane depot ships and six tankers, the sum of 5,000,000 yen being allowed. The *Aki* and *Satsuma* will be used as targets.

Attacking force (blues), composed of the first and second fleet and special service ships as follows:

First squadron: *Nagato, Mutsu, Hyuga, Yamashiro.*
Third squadron: *Tama, Isuzu, Yubari, Sendai.*
Fourth squadron: *Kongo, Hiyei.*
Fifth squadron: *Yura, Natori, Nagara, Jintsu.*
Airplane ships: *Hosho, Wakamiya.*
First submarine squadron.
Second submarine squadron.

Total number of ships of the blues about 50.

Defending force (reds).—An assumed powerful fleet will be organized from the reserve ships, guard ships, and destroyer divisions attached to the different naval stations, and also including the training squadron.

This force with their advance base around Amami-Oshima will try to prevent the attacking force from proceeding north. The actions will be divided into first, second, and third periods, the final action to take place off Tokyo-wan with the *Settsu* as the center, which will have on board the chief umpire. When the maneuvers are over, an address covering the actions of both sides will be made by Admiral Yamanashi, chief of general staff.

The actual time will take 12 days.

The new 15,000-ton tankers and the supply ship *Mamiya* will participate, the *Mamiya* to distribute food supplies in the open sea, something new in maneuvers.

The prince regent will be on board the *Fuso* and will witness the final action off Tokyo-wan.

SUBMARINE "NO. 62" HAS ACCIDENT

Submarine *No. 62* while engaged in attacking maneuvers in Hiroshima-wan on June 14, collided with the *Kongo*. While the details are not given, it is said that the submarine damaged its bow while the *Kongo* sustained damage to one of her propellers.

Owing to frequent accidents to submarines, the navy department has issued orders that submarines while cruising under water must display on the mast or periscope a red sign.

At Kure Station, where the submarine school is located and on account of the submarine activity due to training and also on account of the large number of vessels navigating in the gulf, the gulf has been divided into 13 submarine sections, and only one submarine allowed to operate in one section. Also, in submerging, a guard ship will invariably be located close to the submarine, and every precaution will be taken to detect any trouble which may occur to the submarine.

OIL AT MAIDZURU EXPLODES

The Onami heavy-oil warehouse, situated on the promontory of the Maidzuru naval station, was destroyed by fire June 23, causing damage said to amount to several hundred thousand yen. The warehouse containing a considerable amount of heavy oil exploded with a tremendous concussion and continued to burn for three hours.

Near the warehouse were moored many tankers loaded with heavy oil. The authorities of the naval port immediately ordered the war-

ship *Kasuga* and others to mobilize their fire-fighting corps, but on account of the danger from the constant explosions taking place in the warehouse, they could accomplish very little. The fire died out after all the oil in the warehouse had been consumed. None of the tankers in the harbor suffered any damage.

ALTERATION OF SUBMARINES

Most of our submarines are of Japanese Navy type, and due to the many accidents it has become necessary to make some changes in construction, and this will be tried out on *No. 36* at Kure.

One of the changes will be the enlargement of the conning tower to double its present size. The other alteration changes are being secretly guarded. She will be completed in time to participate in the grand maneuvers, and should the experiment prove successful, all of the Japanese Navy type will be altered in the same manner.

NOTE.—It is not known what the reason of reconstruction is nor has any information been obtained in regard to it other than the above.

COLLISION OF DESTROYERS

A collision between destroyers *Nos. 4* and *18* took place on June 27. The collision took place when the latter was proceeding to the Tsushima Straits in the Japan Sea, towing a target, and the former tried to pass. Destroyer *No. 4* penetrated the starboard side of *No. 18* and destroyed her oil tank. At the same time the bows of both destroyers pierced each other and they had to go full speed astern to get apart. Both vessels were badly damaged. Destroyer *No. 18* took water and it was feared for a time that she would founder, but her crew bunged up the hole with blankets and saved her. There were no casualties. After temporary repairs both destroyers are to be docked at Kure to undergo repairs on a large scale.

AUSTRALIA

DEFENSE POLICY

June, 1924

DEFENSE POLICY

Australia has, at the present time, no active defense policy. The defense forces of the Commonwealth are, by the provisions of the defense act, restricted, except in time of war, to a nucleus for administrative and instructional purposes only. These, however, are elastic

phrases which may be expanded or contracted according to the needs of the country under varying circumstances, or as the whims of a Parliament may determine.

Heretofore, no general interest has been taken in the matter of providing for the defense of Australia. Australians, generally, rely for their defense upon the strength and availability of the British Navy, being of the opinion that Great Britain would be forced, in the event of hostilities, to come to the protection of this portion of the Empire. Added security is also felt in the belief that the United States, for the protection of her interests in the Pacific basis, would not remain uninterested should Australia be threatened by an alien race. However, by reason of certain circumstances which have but lately arisen, this apathetic feeling of security has, to a certain extent been dispelled and Australia has now begun to feel that her actual defense must become a matter of active concern.

Although the defense forces of Australia, in so far as organization, training, and standard of equipment are concerned are British, their control has often vigorously been stated to be subject to the Parliament of the Commonwealth and to no other power. At the same time, while claiming this authority to control its own forces, Australia has made no adequate provision for defense, and those forces, which, during and at the close of the recent war, were in a good state of efficiency, were permitted to lapse and become comparatively disorganized. It is now becoming realized that inasmuch as Australia claims the control of her own defense she must, to a very large degree, provide that defense.

With the announced intention of the British Government to abandon its Singapore-base project, the defense of the dominions in the Pacific is to a large extent thrown upon those dominions, and the defense of Australia becomes thereby a matter directly of Australian concern. So long as it appeared to be the intention of the British Government to proceed with its policy of establishing a naval base at Singapore, the Government of Australia and the Australian people generally felt secure, and it was somewhat apparent that they did not intend seriously or actively to interest themselves with defensive measures. Now that this sedative of Singapore has been removed, the Government has begun actively to consider a defense policy and to review the condition of its defense organization.

Another recent circumstance which has resulted in an awakening of Australia to the probable need of a complete inventory of her defense equipment is the passage by the Congress of the United States of the recent restrictive immigration act whereby Japanese have been excluded from entrance into that country. It has always been the belief and fear of Australians that Japan is continually looking toward the tropical expanse of this Commonwealth as a

solution to her domestic problem of overpopulation. With the doors of both the United States and Canada now definitely closed, the challenge of Japan to the "white Australia policy" is brought appreciably closer, and Australia feels that she no longer enjoys her former security.

Australia is a Pacific power, and such of her own direct interests as are external concern themselves primarily with conditions relating to the Pacific Basin. The circumstances of her relationships in the south Pacific have served to formulate the opinion that, of all the nations whose interests are represented there, Japan is the only country which would, with but slight provocation, disturb her peace in that quarter. This feeling also arises, perhaps, from the fact that, with the exception of Japan, the sources of probable conflict in the Pacific are European rather than local and, therefore, a matter for the concern and regulation of Great Britain. Now, however, with Singapore—the spearhead of British protection—withdrawn, the timeliness of British aid is appreciably reduced and Australian security rendered less stable and her peace less sure. The resumption by Great Britain of her former policy of naval concentration in the Mediterranean also has tended to awaken Australia to a realization of the fact that the oft-repeated statement that "the interests of the world have shifted from the Atlantic to the Pacific" is one perhaps more of theory than of fact, having in consideration, primarily, the military activity taken to protect those interests.

Noting that the circumstances of Empire and other interrelationships have brought somewhat clearly to Australia the necessity of looking to herself for her own protection, it may appear advisable to note the attitude regarding defense policy which has been assumed by the various political parties in Australia. The Federal Government at this time is composed of the coalition of the Nationalist and Country Parties, the Labor Party assuming the rôle of the opposition. With regard to the position assumed by the various parties which compose the political forces of the country, attention is invited to the following editorial article of the Melbourne Evening Sun of May 23, 1924:

It is a grave source of weakness to the composite government that the two sections of it have not been able to see eye to eye on the most vital national questions. The need of a closer union in matters pertaining to the national defense as well as to the national fiscal policy is urgent. It is significant that when Doctor Page, the leader of the Country Party and the holder of the portfolio of treasurer, became Acting Prime Minister during Mr. Bruce's absence, supplies of money for the bare necessities of the air force were curtailed to a point below the minimum. Mr. Bruce's onslaught on the Labor Party, whom he charges with refusing to support measures necessary for the defense

of the Commonwealth, has evoked angry denials from Mr. Gunn, the new Premier of South Australia, and also from Mr. Charlton (leader of the opposition in the Federal Parliament), but those denials do not disprove the charge.

The eyes of the Country Party are turned toward the interior. Their attention is so closely concentrated on rural interests that they can not envisage external dangers. They live far from the sea. Like the American farmers of the Middle West, who hardly know that Europe exists, the Australian Country Party hardly realizes that Asia exists. It is high time that they devoted a part of their attention at any rate to the first problem that should engage the minds of every government.

The Nationalist Party, which is the stronger party of the coalition, is agreeable to the general coordination of Australian with imperial defense, and, while expanding the present defense policy of Australia to meet more adequately the requirements of local defense, they, together with the Country and Labor Parties, are determined to make Australian defense a matter purely of Australian regulation, having in mind more particularly the organization and control of the local defense forces and the degree of their cooperation with imperial forces.

With regard to the relationship of Australia to the Empire, which may involve it in war and which may indicate the attitude which the Commonwealth would necessarily have to assume, attention is invited to the remarks of the Prime Minister at the time of his rendering his report to the Parliament of the results of the recent imperial conference:

> To the imperial conference I explained very fully that Australia became embroiled in the late war because of a treaty guaranteeing the integrity of Belgium—a document of the existence of which probably not half a dozen persons in the Commonwealth were previously aware. I said that we were determined not to remain in a position where we could become involved in another war, in which we might have to sacrifice everything, without a full knowledge of the circumstances that had brought it upon us.
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> To all foreign nations the British Empire is one and indivisible, and it is useless for us to hope that, in the event of hostilities arising as a result of a misguided British foreign policy, the Australian people could stand aside and say that they had no part in the quarrel. It is perfectly true that we claim for this Parliament the right to determine whether Australia is or is not at war, and theoretically that claim is soundly based; but in practice we must have regard to the view that would be taken by any nation with which Great Britain might be in conflict.
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> * * * * * * *
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> So long as we are a part of the Empire we can not escape our responsibilities.
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> * * * * * * *
>
> The next subject is that of defense, which I shall deal with on the basis on which it was discussed at the imperial conference. * * * I took as my starting point the view that we believe in Empire defense as a whole, and that

Australia to-day did not desire to provide for her own defense without cooperation with Britain and the British Navy.

Prior to the departure of the Prime Minister for the imperial conference, the leader of the Labor Party is reported to have stated:

The Labor Party realizes that we must make provision for our own safety, but in no case do we intend to be parties to foreign wars.

Attention is also invited to the following article which appeared in the Melbourne Evening Sun of March 26, 1924:

Labor is watching keenly for the first move of the Government in the provision of funds for defense. Its stand in Australia on this subject is, however, materially different from that of British labor.

The leader of the party (Mr. Charlton) to-day flatly declined to indicate what labor would have to say to any proposal on the part of the Government for a big outlay on defense. "I do not intend to commit myself until I know what the Government intends to do," said Mr. Charlton.

"We will be against any large naval base being built in Australia," said one member, "and we would regard any big defense move as an insult to a neighboring nation.

"Briefly, our policy is that while we oppose the expenditure of unnecessarily large sums on defense, either in Australia or overseas, we favor the construction of cruisers and torpedo-boat destroyers, and we believe Australia should concentrate on submarines and air defenses. As far as a naval base is concerned, we consider only such a base as is required for the light craft I have enumerated should be carried out."

Inasmuch as it is considered that the Labor Party in Australia will soon come into power, their views upon Australian defensive measures are of importance.

As may be ascertained from the foregoing statements, it would appear that the policy of defense which is to be adopted by the present Parliament is one which will concern itself more particularly with the naval and air forces; very little attention, with the exception possibly of the carrying out of the former program of compulsory training and the building up of the training and administrative staffs, is expected to be paid to the military forces. The cruiser navy, with cooperation with the British Navy, and operating on certain bases established around the coast of Australia, will provide the first line of defense. The air force, with certain strategical bases and through cooperation with the naval forces, will form the second line.

It is believed, however, that on account of the expense of developing the first-line defenses, and in view also of the fact that such arm would necessarily serve more particularly as a cooperative arm of the British Navy, the second line of defense, or the air forces, will receive greater consideration as a distinctly Australian and comparatively independent arm. This opinion is stated as reflecting the

viewpoint of public sentiment, the weight of which appears to be favorable to the expansion of the air force. This "partiality" toward the development of the air force has its basis in economy and availability, the lay mind easily comprehending the parallel internal development which flows from the establishment of an air service, more particularly the carriage of mail and commercial matter over regular routes according to definite and frequent schedule. The air services, appealing to the popular fancy, find public opinion more susceptible to their establishment.

In this connection attention is invited to the fact that the A. N. A. (Australian Natives' Association), a body which has no comparable counterpart in the United States, but which has heretofore exercised much influence upon the policies of Australia, an example being the "white Australia policy," adopted at its annual conference at Warrnambool, Victoria, on March 26 last, the following resolution:

> That the association again affirms the urgent necessity for the extension of aerial transport throughout Australia to develop unpopulated areas and to serve as the nucleus of an aerial defense force in time of need.

It is believed that on the policy of enlarging and extending the air force, paralleled with encouragement of civil and commercial aviation, all political parties would agree.

From a geographical point of view, Australia is peculiarly favorable to aerial navigation, the country being almost entirely devoid of high mountain ranges, while the long distances between commercially and strategically important centers render air communication not only extensively possible but economical as well.

As has been stated, Australia at the present time has no extensive air policy. Furthermore, the general nucleus policy with regard to all defense activity has been allowed to disintegrate, and, through retrenchment and inattention, is now in a comparatively disorganized and useless state, a state such as has been described by high military authorities and public men as "worse than a sham." Due to certain circumstances of which mention has already been made as well as to increased public attention to this subject, the ministry has given consideration to the formulation of a comprehensive scheme of defense, significant statements having been made on this point by responsible members. In this connection attention is invited to the following item appearing in the Melbourne Evening Sun of April 29, 1924:

> Mr. Bowden's announcement that a measure will be introduced to increase the air force and establish a seaplane base will be welcomed by what is an increasingly vital branch of the service. The ministry's proposals must be governed by the most urgent requirements of the R. A. A. F.

These are unquestionably as follows:

Provision of a depot and adequate accommodation for all machines.

Reconditioning of service machines now in hand.

Replacement of obsolete machines by one or more of each class.

Provision of greater facilities for experimental work to adapt and create machines to Australian conditions.

Training on a nucleus basis of a larger personnel of air-force cadets and emergency citizen pilots.

Provision for more efficient cooperation with the navy and army.

Suitable seaplane bases near cruising areas of the navy.

Without these improvements it is said that money spent on the air force will be nonproductive.

While it is believed that the policy to be laid down by the Government will follow closely the above outline, attention must be invited to the fact that no policy has as yet been announced.

Although the flying personnel authorized and approved for the permanent forces has not been maintained, it is believed that under the new policy the former number of authorized personnel will not only be enlisted but that the number will be increased. The number of pilots capable of rendering war service, with a slight amount of additional training, will be augmented by the introduction of a larger number of cadets, together with citizen and emergency pilots who will be subjected to refresher courses. The number of personnel, together with equipment and landing and training fields and stations, is not sufficient at the present time to carry on citizen or cadet training to any appreciable extent; the only aerodrome school now available is that at Point Cook, Victoria. It would appear, therefore, that before any appreciable increase in the flying personnel of the air forces could be accomplished, the establishment of the proper training personnel and equipment must first be secured.

While the present state of airplane equipment is set forth in a later portion of this report, mention need only be made here to the fact that the ministry, realizing the deteriorated and obsolete condition of such equipment, is preparing to bring down a policy which will provide for the reconditioning of all available machines on hand, as well as the purchase of one or more of the more modern types suitable for the various branches of air service. In this connection, attention is invited to the following article from the Melbourne Evening Sun of April 29, 1924:

While the air force has a number of fairly good fighting machines in the more important classes it is far behind the march of progress.

For instance, the S. E. 5A scouting machines are very fast and high-powered, but they have been superseded by modern models. Regarding this and other classes, there is a paucity of reliable information as to the most efficient types for the future, but the Air Ministry in England is said to have plans under consideration.

New machines specially required for the air force are:

(*a*) Army cooperation machines—*DH9* now in use.

(*b*) Light bombers—*DH9a* now in use.

(*c*) Navy cooperation machines—Fairey *3D* now in use.

It has been impossible up to the present to give attention to the training of citizen forces who desire air-force work, or to refresher courses for men who gained valuable experience with the Australian Flying Corps during the war. The machines on hand at present are quite suitable for training purposes.

It is believed that attention will be given to the encouragement of manufacturers to introduce plants for the purpose of constructing airplane engines and other essential and component parts. In this connection the following item will be of interest:

Airplane engines will have to be imported for some time, but there is every reason to suppose that they can be built here. That is the only satisfactory way, because the life of an airplane is so short that a continuous supply produced on the spot is the only method by which an adequate provision can be insured. All this will cost money and effort. But without money and effort and sacrifice no country can be safeguarded. (Sun, May 23, 1924.)

With regard to the local manufacture of airplane engines, it may be pointed out that record is had of only six airplane engines of the Renault type having been manufactured, these in 1915. While most plants for the manufacture of airplanes have gone into liquidation, it is intimated that with the probable encouragement of civil aviation to be given by the Government, these plants may return to activity; their production will, however, not be large, and it is believed that they will build only according to already established models.

With regard to the establishment of routes, bases, and landing fields, attention is invited to the fact that Wing Commander Goble of the R. A. A. F. recently made a tour of the Commonwealth in a Fairey *3D* seaplane for the purpose of determining upon suitable seaplane bases for cooperation with the navy for defensive operations. With reference to the results of the flight, the following item from the Melbourne Herald of May 22, 1924, may appear of interest:

The flight revealed that Australia, from a defense standpoint, is relatively rich in good seaplane bases. There are certainly enough natural harbors suitable for this purpose to make the seaplane a most effective defensive weapon. The new bases "tried out" on the flight were Townsville, Q., Thursday Island ("a magnificent base"), Darwin (fair), Napier and Broome (fair), Port Headland (good), Albany (ideal), and Port Lincoln.

As Wing Commander Goble pointed out yesterday, however, the use of all these places, especially those in the north, is entirely out of the question until they have been put upon a proper footing. This would mean the erection of slipways, electric cranes, hangars, and wireless communications.

In speaking of the establishment of airplane and seaplane bases, the Minister for Defense (Mr. Bowden) said:

We are going to establish a seaplane base in Sydney Harbor.

No; I will not tell you at what point in the harbor it is to be located.

A unit of five planes will be stationed there. We have five planes at present, which are quite up to date. Wing Commander Goble is using one of them in his flight into the north in search of a possible base for seaplanes there.

It will, I think, be necessary to have a small air unit in the north somewhere. That may mean anywhere from Townsville to Darwin. The question of basing some seaplanes on Albany is also under consideration.

If all these bases are established, I hope to be able to work the equipment in conjunction with civil aviation planes, and make them carry mails, and so on.

There is another proposal for the establishment of a unit of the air force at Richmond, N. S. W. This would serve the double purpose of giving us planes at hand for the defense of Sydney and providing us with facilities for the training of men of the citizen forces.

It is believed that first consideration will be given to the survey of defensive and commercial airways, and the establishment of landing fields and bases, the perfection of the ground organization being, to a certain extent, a matter of precedent to the maintenance of an adequate air defense and service.

The sum estimated as "earmarked" for defense expenditure has been computed as follows:

Two new cruisers	£4,000,000
Two submarines	600,000
Air force	1,300,000
General	1,000,000
Total	6,900,000

The £1,300,000 set out alone for the air force includes £300,000 for a depot. This is said to be a conservative estimate and could be spread over four or five years.

The balance of £1,000,000 is said to be sufficient to enable the air force to place its organization on a sound productive footing and could be distributed for the training of more personnel, the reconditioning of machines, and the preliminary costs in connection with bases.

Until the Government's defense policy is definitely brought down no accurate survey can be made of the air equipment of the Commonwealth. The present condition of Australian air defense is, however, set forth in the following outline:

Organization and Control

With general reference to the organization of the defense forces of the Commonwealth, it may be stated that with the abolition of the portfolio of the Minister for the Navy (1922), and the amalgamation of other defense activities the administration of defense in the Commonwealth has become centered in the defense department, under the political control of one minister.

The various branches of the defense department and the manner in which they are administered, are:

The Minister for the Defense—

Service	Administered by—
Naval forces	The naval board.
Military forces	The military board.
Air force	The air board, which is responsible to the air council.
Civil aviation	Controller of civil aviation.
Munitions supply	Munitions supply board.
Rifle clubs, etc	Secretary of department.

The activities of the various branches of the defense department are coordinated by means of a central committee called the council of defense, the membership of which is composed as follows:

Council of defense—
President: The Prime Minister.
Members:
The treasurer.
Minister for Defense.
First member of naval board.
Second member of naval board.
Inspector general of military forces.
Commander citizen military forces.
Chief of the general staff.
Secretary: Appointed (now acting).

As indicated in the above outline of the administration of the department of defense, the Royal Australian Air Force is administered directly by the air board, which is responsible to the air council.

In relation to the administration and command of the air forces, the air board shall be responsible to, and subject to the control of, the air council. (Air council regulations, 1920.)

While therefore the council of defense coordinates all defense activities, the air council is directly responsible to that body for the administration of the air force, and is required to advise with regard to air policy. The air council is composed of the following:

The air council—
President: Minister for Defense.
Members:
A naval member.
A military member.
Two members of the air board.[1]
Controller of civil aviation.
Secretary (may be secretary of air board).

Meetings of the air council are convened by the president monthly; four members constitute a quorum, but of these one must be the naval member and the other the military member.

[1] One nominated by the naval member and the other by the military member. (Air council regulations of 1920.)

The functions of the air council, as prescribed by the regulations governing that body, are:

FUNCTIONS OF AIR COUNCIL

1. To advise the minister upon the air force provision necessary from time to time for the defense of Australia.

2. To coordinate the air force requirements of the naval and military forces, respectively, and to advise upon questions of principle affecting command and administration resulting from the distribution of the air force.

3. To advise the minister upon all matters of policy or principle affecting the organization, distribution, and preparation for war of such air forces as may be established.

4. To allocate the funds made available for air defense.

5. To advise upon the general control of Commonwealth air policy in its naval and military aspects and to coordinate civil aviation therewith.

6. To advise and make recommendations upon such matters as the council may direct shall be referred to it from the air board.

In accordance with the provisions of section 3 of the air board regulations (statutory rules, 1922, No. 161–*a*) the air board is charged with the control and administration of the air force upon the policy laid down by the minister. Upon all matters which the air council so direct, the board shall submit for the approval of the council its conclusions, recommendations, or decisions.

By section 2 of the above regulation, the air board is to consist of two air members with flying experience and a finance member; by section 5 a secretary is also provided for who, under direction, shall perform the usual secretarial duties.

The air board—

Chairman: The first air member.

Members:

The second air member.

The finance member.

Secretary appointed.

(The chief of the air staff shall be the first air member and the chief of the administrative staff shall be the second air member.)

The air board, in its corporate capacity, is required to submit its recommendations for approval of the air council, upon the following subjects:

1. Principles of organization of the air force.

2. The distribution of the air force.

3. The demands for aircraft of the naval and military departments and the allocation of the air force to meet them.

4. Selections of air stations and aerodromes.

5. Schemes for air force development.

6. Works and buildings not part of approved policy.

7. Training policy: The selection and distribution of schools and training establishments.

8. The selection of the air staff of and above such ranks as the air council may determine.

The first air member, or, as he is known in his individual capacity, director of intelligence and organization, is, other than the title implies, charged with all preparations for war in its relation to the air forces of the Commonwealth. The second air member, or director of personnel and training, is in general charged with the supply, general control, records, and distribution of all personnel, and the provision, storage, and issue of the requirements of the air force. The finance member discharges such duties as his title implies.

The Governor General, being the commander in chief of all armed forces in the Commonwealth, is empowered to constitute the air council and the air board. He is also empowered to:

(*a*) Appoint any part of the Commonwealth to be an air force area.

(*b*) Divide any air force into groups.

(*c*) Direct what forces shall be established in air force areas and groups, respectively.

(*d*) Appoint and promote officers of the air force and issue commissions to them.

(*e*) Appoint an officer or officers of the air force to command the whole or any portion of the air force.

By clause (1), section 3, of the air force act, 1923, the Governor General is empowered to raise, maintain, and organize the Royal Australian Air Force for the defense and protection of the Commonwealth.

The organization of the air force which has been adopted for the present, but which it appears will be subject to extension at an early date, is, with regard to the active forces, comprised as follows:

ORGANIZATION OF R. A. A. F.

Headquarters: Located at Victoria Barracks, Melbourne.

Stations: Station located at Point Cook, Victoria, consisting of—

- One station headquarters for administrative purposes.
- One flying training school for the training of pilots, observers, aerial gunners, nad wireless operators
- One aircraft depot for the handling, storage, overhaul, and repair of aircraft equipment.
- One mixed land-plane squadron for collective training of units by cooperation with the naval and military forces.

Aircraft depot base, Laverton, Victoria (site only).

Seaplane training base, Corio Bay, Victoria (site only).

Richmond aerodrome, New South Wales (site only).

The air force, more particularly of the defense forces of the Commonwealth, is subject to the regulation and control of the Federal Parliament, whether such forces are within the territory of the Commonwealth or on service abroad. As indicative of the determination of the Commonwealth Parliament to remove its defense forces from outside control, attention is invited to the fact that during the recent Parliament a bill was introduced, relating to the air force, wherein

the Australian air force was to be made subject to the imperial air force act, which incorporated the punishments provided in the British Army act. The original bill, which was withdrawn, and the substitute bill were met with such strong objection that they could not be passed by the Parliament until the following subclause was added:

> Notwithstanding anything contained in this act, the imperial act, called the army act, and any acts amending or in substitution for it and for the time being in force, shall not apply to the air force. (Sec. 3, clause (5), air force act, 1923.)

As indicative of the right of the Commonwealth to maintain control of its air force whether serving within Australia, or on foreign service, attention is invited to the following excerpt from Hansard, No. 19, of August 25, 1923:

AIR FORCES—STATEMENT BY THE MINISTER FOR DEFENSE

Senator Elliott asked the minister representing the Minister for Defense *upon notice:*

1. With reference to the statement made by the minister to a deputation representing the Australian Natives' Association at a recent interview to the effect that in the air defense act of Great Britain power was given to the Commonwealth to make laws relating to its own forces outside territorial limit—is not such provision exactly similar to the provision in the army act in force during the war?

2. Is the minister confident that the provisions go as far as he apparently assumed?

Senator WILSON. The answers are:

1. Yes.

2. The minister is advised by the solicitor general that his interpretation of the law is correct.

Although it is evident that the Australian authorities intend to maintain the control of the air forces in their own hands, it is, nevertheless, observed that:

> In order that the Royal Australian Air Force may be able, in case of war, to take its place as a part of the air force of the Empire without alteration or dislocation of its peace-time principles of organization, administration, training, and equipment, it is the policy to adopt in such matters the principles laid down by the Royal Air Force with only such modifications as are dictated by local conditions.
>
> To insure this cooperation, an officer of the Royal Australian Air Force is located at the Air Ministry in London as a liaison officer. This officer keeps the air board up to date on all matters affecting the air forces, and also furnishes the British authorities with information relating to Australian activities. He is also responsible for the placing of contracts through the British Air Ministry for any material required by the Commonwealth. (Report from the joint committee of public accounts on the expenditure upon air services, 1923.)

The air force in Australia therefore is patterned after the imperial air force, and it has been the policy of the Australian authorities to

alternate, for a period of two years' instruction, the assignment of the first air member and the second air member to the British air school for officers at Camberly, Surrey, England. The first air member is at present assigned there.

The air force itself is divided into the permanent air force and the citizen air force, of which more will be said farther on in this report.

Enlistment and Instruction

Part III, division 1, section 30, of the defense act, 1903–1917, states:

30. The defense force shall consist of the naval and military forces of the Commonwealth, and shall be divided into two branches called the permanent forces and the citizen forces.

Under the defense act, 1903–1917, as above referred to, no provision was made for the creation of a separate air force; such an arm was operated by the military and naval branches as integral portions of their organizations. However, following the policy of the British authorities, the Commonwealth, by the air force act, 1923, created the air force as a separate arm. This action was authorized under section 3 of the air force act, as follows:

3. (1) There shall be an air force, to be called the Royal Australian Air Force, which may be raised, maintained, and organized by the Governor General for the defense and protection of the Commonwealth and shall be part of the defense force constituted under the defense act.

(2) The Royal Australian Air Force raised under the defense act and existing at the commencement of this act shall be deemed to have been raised under this act, and the members thereof, without any reappointment or reenlistment or the taking of any fresh oath, shall be subject to this act.

The air forces are further made subject to the provisions of the defense act, with the exception of Part XV, which has reference to military colleges and the training of the personnel of the military forces.

Permanent Air Forces

As set forth in section 30 of the defense act, the forces of Australia shall consist of the permanent and citizen forces. The air force, being subject to the provisions of the defense act, is also thus constituted.

The permanent forces consist of the officers appointed as officers of the air force, and of the airmen who have enlisted therein, under the act, and who are bound thereto by an oath and a period of enlistment. The Commonwealth has no large permanent force and is not authorized to maintain such force by the defense act:

31. (2) Except in time of war no permanent military forces shall be raised, maintained, or organized except for administrative and instructional staffs, including staff corps, aviation, survey, army service, medical, veterinary, and ordnance corps, artillery, fortress engineers, and submarine mining engineers.

Enlistments in the permanent forces of the air force are therefore only sufficient to provide for the clerical and instructional staffs only, including officers. With regard to the commissioning of officers, the following item is of interest:

An interesting feature of the new appointments is the provision of "short-service commissions" in addition to the permanent commissions. This, it is stated, is a new procedure in Australia as regards defense forces. It is in accordance with the custom followed in the imperial air force. Men appointed to the "short-service commissions" have to submit themselves for reappointment at the end of four years. (Argus, of October 26, 1923.)

The Minister for Defense, upon the second reading of the air force bill, in speaking of commissioned officers of the permanent forces, said:

An officer trained by the Royal Australian Air Force, on receiving a commission in the air force will be compelled to serve for eight years, unless the board gives him permission to retire. (Hansard, June 29, 1923.)

Before the passage of the air force act the officers of the air force, being subject to the defense act, were not permitted to hold permanent commissions, inasmuch as the defense act permits only graduates of the Duntroon Military College to hold such commissions.

Airmen, or the enlisted personnel of the air service, are enlisted for six years, and for the purposes of pay are classified in five groups. Such classification, however, does not affect classifications for the purpose of command and precedence.

INSTRUCTION

The only school of aviation available at the present time for the instruction of the personnel of the air force is that located at Point Cook, Victoria. Instruction is here given for persons qualifying for pilots, observers, aerial gunners, and wireless operators. The courses are both theoretical and practical, and follow closely, if they are not identical with, the courses of instruction prescribed for the royal air force.

To other than officers of the air force, training is given to certain officers seconded to the air force from the army and navy, as well as to such civilians as have been recommended by the controller of civil aviation or who have made application for such training and have fulfilled the requirements set forth in the Government's Gazette notice of such vacancies. After the completion of their course of training the officers of the military and naval branches remain with the air force for two and one years, respectively, and will then return to their units, but a few may be transferred to the air force: of the civilians, they must give an undertaking that on the successful completion of the course they will serve for eight years as officers in the citizen air force or the air force reserve, as may be required.

CITIZEN OR RESERVE FORCES

In the provisions of the defense act relating to universal training and the assignment of cadets to the various branches of the defense forces no provision is made for the allotment of any portion of such cadets to the air force for training. There is at present no citizen air force in existence, although the creation of such a force is in contemplation.

It is estimated that there are in Australia about 500 officers who received training as pilots during the war. Upon the passage of the necessary legislation, it is contemplated that a reserve will be established to include as many of these men as are available; among these will also be enlisted all pilots and mechanics engaged in civil aviation work throughout the Commonwealth.

The lack of the existence of a citizen force is due to the absence of any adequate facilities to provide for their training, this deficiency being mostly in the form of equipment and aerodromes. It is stated that the personnel for training and administration is quite capable of meeting a considerable degree of expansion.

Strength of Forces

PERSONNEL

The approved establishment of the permanent air force comprises 52 officers and 300 airmen; the present strength, however, is stated to be 49 officers and 296 airmen. Of the officers, 31 are pilots, and of these 19 are at the training aerodrome at Point Cook, 8 are at Victoria Barracks, and 4 are in civil aviation and are also located at Victoria Barracks, Melbourne.

The entire officer permanent personnel is divided as follows, according to rank:

2 wing commanders.
8 squadron leaders.
15 flight lieutenants.
20 flying officers.
4 pilot officers.

For the purpose of retirement in the air force, the age limit, for flying personnel is 40 years for flight officers or flight lieutenants, 45 years for squadron leaders, and 48 for wing commanders; for the ground personnel the age limit is 55 years and for noncommissioned officers 60 years.

Other than the permanent air force personnel listed above, there is provision made for the training yearly of four officers from the navy, four from the army, and four from civil aviation. At the present time, however, there are in training at Point Cook, one

officer from the navy, and five each from the army and civil aviation branches. The reason for the small representation from the navy is the lack of seaplane facilities, Point Cook being unsuitable for that purpose and no other base for seaplanes having been established.

The type of officer personnel connected with the permanent forces in Australia is exceedingly high, capable of intensive training in both theory and practice. Their morale is quite good, and, now, with the passage of the air force act (1923), it is believed that their retention in the air force of Australia is assured.

There is at the present time no air force reserve personnel, but, with the fruition of the plans of the defense authorities, such a personnel and force will be provided.

EQUIPMENT—LANDING FIELDS, BASES, ETC.

Up to the present, the sites, buildings, et cetera, in use by or acquired for air force purposes comprise:

Point Cook, Victoria, where 817 acres have been acquired at a total cost of £10,396. The area is situated on the western shore of Port Phillip Bay, and is 5 miles from the Laverton Railway Station on the Melbourne-Geelong line. Workshops, offices, quarters, and other buildings, together with the necessary accessory services, have been erected from time to time according to the developmental plans and lay-out drawn up some years ago. The total expenditure on this site up to the present for buildings and other works amounts to approximately £180,000.

All existing air force units comprising No. 1 station are at present located at Point Cook. The aircraft and equipment are provided for in 7 permanent hangars and 10 temporary canvas hangars. Personnel are housed partly in permanent buildings, consisting of 12 married quarters, 2 blocks of single officers' quarters accommodating 45 officers, and 2 blocks of single airmen's quarters accommodating 66 airmen, whilst 200 airmen are accommodated in iron huts similar to those used in camps during the war. Tenders are now being called for additional accommodation to provide for 56 mechanics in single quarters and 6 married noncommissioned officers. The estimated cost of these buildings, together with dining and recreation rooms and necessary accessory services, is set down at £31,500.

Laverton, Victoria.—An area of 160 acres adjoining the railway was acquired in September, 1921, at a cost of £3,528. This site is to be developed, as funds permit, as an aircraft depot, where aircraft and equipment may be mobilized and modifications and repairs effected. The eventual cost of the establishment of this depot is estimated to be about £300,000. Proposals and plans for the first installment of this work are now with the parliamentary standing committee on public works.

Corio Bay, Victoria.—An area of 125 acres on the northwest shore of Corio Bay was acquired in October, 1921, at a cost of £4,824. This site was intended for use as a base for flying boats and torpedo-carrying craft and for training purposes. No other expenditure has been incurred on this site, which, in exchange for agistment purposes, is being kept free from noxious weeds and vermin without cost to the department. From the evidence given there does not appear to be any intention to develop this site at present.

Richmond aerodrome, New South Wales.—An area of 125 acres, together with a large hangar, quarters, and other buildings, situated at Richmond, about 40 miles from Sydney, is being acquired from the New South Wales government. This aerodrome was established by the State government during the war to assist in training of pilots. As the price agreed upon, £9,318, was satisfactory to the Commonwealth Government, it was considered that the possession of this aerodrome in the vicinity of Sydney would enable the air force to cooperate with the military forces near that city and provide the necessary facilities for the future citizen air force in New South Wales.

While this information is secured by reference to the "Report from the joint committee of public accounts on the expenditure upon air services" of 1923, it is believed that the same conditions prevail at the present time, with the exception that the aircraft depot at Laverton has been abandoned. The new site has not yet been determined but it is believed that it will be established in the State of Victoria and situated near Melbourne. With regard to the abandonment of Laverton, the minister for defense recently said (Melbourne Evening Sun of April 29, 1924):

> We had intended to set up the necessary accommodation at Laverton, near Melbourne, but the public works committee turned down the Laverton proposal on the ground that the place was on the fringe of the noxious trades area for Melbourne, and therefore unsuitable for residential quarters for the air force.
>
> Another site is now being considered by the public works committee. It is about 3 miles from Melbourne.

The site which the committee now has under consideration is one of 180 acres, between Laverton and Werribee, on the Geelong Road, in the vicinity of what is known as Hoppers Hill. This proposed aircraft depot is estimated to cost £19,000 more than the site originally selected, which was carried on the estimates at £297,000.

It is also reported that the Richmond (N. S. W.) aerodrome is to be reestablished during the present year, and that machinery for constructing and repairing aeroplanes would be installed.

Attention, with regard to the establishment of bases for the air force, is invited to the following news item which appeared in the Melbourne Argus of December 13, 1923:

> Capt. E. C. Johnson, Federal superintendent of aerodromes, has arrived in Perth to supervise preparations for an airplane base in the metropolis. The Federal Government recently purchased from private owners 131 acres of what is known as the peninsula, on the Swan River at Maylands. It gives a run of half a mile from any point of the compass for taking off and landing, while the river provides a good landmark from the air. The area is ample for present and future developments on a fairly extensive scale.

In intimating the further development of the air force, in the matter of bases, it has been stated that the Government would propose in its policy speech at the opening of the next session of Parliament the establishment of a seaplane base in Sydney Harbor, a

new airplane base near Melbourne, and the possibility of a seaplane base in the north (either Darwin or Elcho Island) and at Albany, W. A. It will be sufficient at this stage to state that at the present time Wing Commander Goble, R. A. A. F., accompanied by a flying officer of the air force, has already proceeded some distance on a seaplane flight around the coast of Australia for the purpose of making a report on suitable seaplane bases, more particularly in the north and northwest.

With regard to the division of the Commonwealth into air districts for the proper coordination of mobilization and defense, attention is invited to the following remarks of the minister for defense in speaking in support of the air defense bill:

> Power is given to the Governor General to proclaim air districts. This power will not be used at the present time, because the only State in which we have an air force is Victoria. It is thought that with the development of the force some units may be allotted to different military districts, such as New South Wales, Queensland, South Australia, or other States. Power is therefore required to proclaim air districts, the boundaries of which will be probably the same as those of the military districts proclaimed at the present time.

It should be borne in mind that this statement was made in support of the air defense bill which was defeated in Parliament. However, the air force act, 1923, which was a drastic modification of the original bill, and which is of a general regulatory nature, provides for the air force to be "raised, maintained, and organized by the Governor General for the defense and protection of the Commonwealth," and it is believed that the remarks of the minister are capable of application, relative to conditions and policy, to the recent act.

With regard to the establishment of air routes for defense purposes, attention is invited to the following:

> The aerial routes necessary for defense purposes are organized by the Royal Australian Air Force, thus enabling those engaged to acquire a knowledge of the country. Landing grounds on such routes may be used by civil aircraft, but should additional landing grounds along these routes be considered necessary for civil aviation purposes, such grounds are provided from civil aviation funds.
>
> The aerial route from Geraldton to Derby in Western Australia was organized by the Royal Australian Air Force in 1921 to enable the aerial service to be operated. Several areas of land were acquired and prepared for landing grounds.
>
> A preliminary survey has been made of a proposed aerial route for strategical purposes connecting Brisbane, Sydney, Melbourne, Adelaide, and Perth.

No regular or continuous flights have been made over these routes, although occasional flights have been made from Melbourne to either Sydney, N. S. W., or Adelaide, S. A. It is believed that although the survey work for the establishment of such routes has been made, no actual laying out of landing fields and aerodrome equipment has been

undertaken. As heretofore stated, the chief of the air force in Australia is at present making a flight around the coast of Australia in a Fairey seaplane, for the purpose of establishing routes and bases for seaplane and naval cooperation. Within a few days a like undertaking will be made by the director of civil aviation, using a land plane, for mapping out a land route for defense purposes.

EQUIPMENT—PLANES, ENGINES, ETC.

The defense forces of the Commonwealth, including the air force, being restricted both by policy and statute to a purely nucleus defensive basis, it is not to be expected that the supply of airplane flying equipment would be of an extensive nature. The greater proportion, if not the entire proportion of the equipment on hand here is composed of post-war gift materials from the Imperial Government.

In August of 1922, the air equipment of the Commonwealth was stated to be composed of 153 airplanes and 6 seaplanes. Of these, 127 were the gift of the British Government. Fifty-two had been erected and overhauled, while 101 were still crated and stored.

The report of a joint committee on the air services, 1923, referring to equipment, states:

> On the termination of the war, the Imperial Government generously presented to the Commonwealth aerial equipment comprising 128 airplanes of various types, their appropriate engines, mechanical transport of various kinds, and a very large assortment of spares, stores, tools, workshop machinery, and accessories of all descriptions, to the value of £1,000,000. The number of airplanes so presented was for the proposed equipment of four service squadrons and one training squadron—100 machines—together with the replacement of 28 machines which had been donated during the war by various citizens and patriotic bodies in Australia.
>
> Twenty-seven airplanes are at present in commission. It was stated in evidence that 24 additional machines could, if necessary, be put into use in a month, and given sufficient personnel all the machines in store could be brought into commission in about four months.

According to a recent article in the Melbourne Evening Sun, of May 22, 1924, the present air equipment of the Commonwealth is as follows:

Equipment R. A. A. F.

Number	Type of plane	Type of engine	Spare engines	Use
[1] 28	De Haviland 9	230-h.p. Puma	6	R. and P.
30	De Haviland 9A	400-h.p. Liberty	60	R. and B.
35	Scout S. E. 5A		6	S.
35	Avro	Rotary	6	T.
[2] 6	Fairey, seaplane	375 h.p. R. Royce	6	Su. and R.
[2] 6	Avro	Rotary		T.
140			84	

P.=photography. R.=reconnaissance. S.=scout. Su.=survey. T.=training.

[1] Early gifts from British Government to compensate for 41 gift planes donated by the Australians during the war.

[2] Purchased, since the war, by the Australian Government

Of the 140 airplanes and seaplanes acquired by the Commonwealth Government, there are at present at the Point Cook aerodrome:

Fairey seaplanes	3
De Haviland 9A	5
De Haviland 9	7
Scout S. E., 5A	6
Avro training	12
Total	32

The British Government has also presented the following equipment for the use of the air force:

35 motor cycles.
44 Leland tenders.
39 Crossley tenders.
Together with £5,000 worth of repair equipment.

This equipment is being temporarily stored at various places in and around Melbourne pending the concentration of all air stores at an air depot which it is contemplated will soon be determined upon. At the present time, due to inadequate and improper storage, much of this equipment is rapidly deteriorating in condition as well as becoming obsolescent.

The air force in Australia has not kept pace with the improvements made in aircraft since the war, and while the actual number of modern machines on hand is not known, it is not believed that they cover the various branches of air activity. Although recent events have done much to awaken a degree of interest and action regarding defense measures, with particular reference to the air forces, no definite policy has yet been announced by the Government looking toward concrete improvement. It is anticipated, however, that definite action resulting in an enlargement of the air force and the acquisition of adequate equipment will soon be taken, statements having already been made by the prime minister and the minister for defense which tend to convey the impression that a movement in this direction will shortly be taken.

MANUFACTURE OF AIRPLANE EQUIPMENT

With regard to the manufacture of airplanes and airplane equipment in Australia, reference is made to the "Report from the joint committee of public accounts on the expenditure upon air services, 1923":

Recognizing the necessity for Australia to be self-contained to the greatest degree, it is the aim of the air board to get as many items of air force equipment manufactured in Australia as possible, and it has endeavored to interest local firms in its requirements. Examples of equipment locally manufactured or for which contracts have been let comprise floats and wings for seaplanes.

radiators, propellers, dope, shock absorbers, turnbuckles, and numerous spare parts of engines and aircraft general stores, the manufacture of which had never previously been attempted in this country.

In August, 1921, the Australian Aircraft and Engineering Co. (Ltd.), of Mascot, Sydney, was given an order by the department of defense for the manufacture of six Avro training machines—two airplanes to have metal fittings of English manufacture, and four to have metal parts manufactured locally from imported material. Australian-grown timber to be used throughout. Although machines of this type were not required at the time, the order was placed with a view to encouraging manufacture in Australia. The company was assisted in its undertaking by being advanced at the outset of its contract a sum equivalent to one-third of the total contract price, and later by extensions of the date of delivery. The machines were eventually completed and passed all tests satisfactorily. The engines installed in these machines were supplied to the contractor from air force stock.

Although the production of aircraft in Australia has been accomplished and has proven fairly satisfactory, it may be pointed out that the lack of governmental activity and support for air services, both military and civil, has, together with the apathy of public interest in all phases of air activity, caused all plants which had been erected during and since the war to go into liquidation and to cease airplane manufacture. The plants and their personnel may, however, to a certain extent, still be available for limited aircraft manufacture.

Evidence tendered to the committee showed that the manufacture of engines themselves might be undertaken in the Commonwealth fairly economically, provided the necessary material could be obtained. For some years to come however, it was considered that the demand in this country for such engines would not justify the establishment of a local factory as a commercial concern.

It was considered that no difficulty would be met in securing the necessary skilled labor, because, in addition to the men who have received training in the small-arms ammunition factory, there are now in Australia many artisans who, as munition workers, gained valuable experience abroad during the war.

As an instance of what can be accomplished, it was pointed out that six airplane engines of the Renault type were manufactured in 1915 by Messrs. Kelly & Lewis and the Tarrant Motors Pty. (Ltd.), of Melbourne.

It is to be noted that Australia does not possess a sufficient quantity of raw materials required in airplane construction adequately or successfully to enter upon that phase of production. Nor is it believed that, at the present time, the economical survey of the industries of Australia is sufficiently complete to render any immediately valuable assistance, many months being necessarily consumed in further survey and organization as well as material transition. Furthermore, it is not believed that Australia possesses any great reserve of raw materials for the manufacture of aircraft or equipment, and by her remoteness from and dependence upon other powers for essential supplies would rapidly become embarrassed should hostilities become engaged in.

Although all types of airplanes may be flown successfully in Australia, experience has proven that, due to the variable and differential climatic conditions, many modifications in design are necessary to make such flights continuous and economical. In order to ascertain the best methods to meet these conditions, an experimental station has been established at Randwick, near Sydney, N. S. W. Here there is provided a wind tunnel for the testing of plane design, radiator and shutters, and engine, the climatic conditions in Australia causing frequent overheating. Owing to many of the landing fields becoming overgrown with grass to a height which causes much damage to propeller tips, the four-bladed propeller is being experimented with for all types of planes.

General structural weaknesses in air planes, as well as those which occur because of local conditions, are given attention. Instruments are examined and studied with a view to improvement and adaptation, and models for future local manufacture made. Importations of the recent foreign improvements in plane, engine, and equipment are authorized on a conservative scale for study and possible adaptation and use.

The Bureau of Science and Industry has carried out lengthy tests with such fuels as eucalyptus oil and power alcohol produced from sugar, and experiments are being made to adapt such fuels to air use. The University of Melbourne has erected a wind tunnel and courses in aerodynamics and allied subjects are being given.

As of possible interest in the matter of aerial photography, the following item from the Melbourne Argus of April 2, 1924, is made available:

> A new aerial camera containing a number of novel features has been invented by Mr. W. H. Hansom, and the first one was completed at the engineering works of the Shaw-Ross Aviation Co., Port Melbourne.
>
> Mr. Hansom has taken oblique photographs when flying at 126 miles an hour, and in spite of this high speed a perfectly "sharp" photograph has been obtained. The camera can be very rapidly operated, for on one occasion Mr. Hansom succeeded in taking 12 photographs in three minutes when flying. But possibly the most original feature is the focusing, for the focus can be instantly changed in the air between the limits of 10,000 and 25 feet. This is a great improvement, for the fixed focus of the ordinary aerial camera limits its usefulness.

Experimentation and investigation into air-service problems, although perhaps of an intensive character, is not believed to be general or correlated to any degree, dependence being placed to a large extent upon information made available from imperial sources.

FINANCIAL APPROPRIATION

Provision for aviation was first made on the estimates for the financial year 1913–14, when the sum of £3,012 was provided to meet preliminary expenditure at Point Cook. As the work proceeded and aviation developed, increased amounts were voted under the departments concerned. For the first few years nominal amounts toward the establishment of a Royal Australian Naval Air Service were provided on the estimates, but the expenditure was small, as set forth in the following table:

Year	Appropriation	Expenditure
1917–18	£5,000	£320
1918–19	4,000	1,976
1919–20	2,000	1,413

The financial provisions made for the use of the air service were, up to the year 1920–21, made to the various departments generally, and it was not until the year mentioned that appropriations were made directly to the air forces. The amounts appropriated and expended for such service since that time are:

Year	Appropriation	Expenditure
1920–21	£500,000	£135,195
1921–22	382,551	245,479
1922–23	250,000	188,955
1923–24	[1] 1,300,000	

[1] Estimated as the probable full appropriation; earmarked for a period of years.

Due to delay in the construction of new sites and depots, as well as the lack of any definite policy concerning defense measures, a large proportion of the appropriations for air service equipment and construction has been turned back into surplus each year. However, as the result of the recent imperial conference and the rejection of the Singapore base scheme, it is believed that the problem of air defense will be given more definite attention.

MOBILIZATION

Inasmuch as the only existing air force and depot units of the Commonwealth are those situated at Point Cook, Victoria, the problem of mobilization has not been given any practical test. No maneuvers of any kind which might give practical experience and knowledge of the extent of the mobility of the air forces under present conditions have, so far as is known, been made.

While it would be conceded that mobilization of the actual flying or air-mobile equipment would present a comparatively simplified problem as compared with land mobilization, it is to be remembered that the ground equipment of the air forces would suffer the same disabilities. In this connection, therefore, it becomes of importance to mention that there are no arterial roads suitable for military transport in Australia, nor are the roads at present in use of such character as to be suitable for even a short period of war-time traffic. The question of the construction of arterial roadways capable of serving as military highways has been considered but nothing as yet has been done in this direction, nor is it anticipated that any extensive action will be taken in the very immediate future.

The railways also present a very grave problem because of the different gauges in use in each State, thus necessitating delay and probable loss of equipment at the various transition points. The question of the unification of the railway gauges of the Commonwealth has been the subject of investigation by numerous commissions appointed for that purpose. The commissions' reports have, in each instance, favored the adoption of the standard 4-foot 8½-inch gauge, but, up to the present time, no conversion has been accomplished. The matter, however, continues to be included on the agenda paper of the various Commonwealth and State conferences.

Inasmuch as the railways and roadways skirt the coastline from a short distance above Brisbane, Queensland, to Fremantle in Western Australia, the north and northwest, together with the vast interior, are entirely defenseless and unprotected except for the futile efforts of a small and useless navy. While it is apparent that the lack of mobilization facilities is detrimental to an adequate defense, it also appears that such an absence of transportation facilities is a great obstacle against the successful invasion of the continent from the north, although offering opportunity for the establishment of a valuable base for concentration and operation.

Mobilization for defense would doubtlessly be based on Sydney (including Newcastle) and Melbourne in the first instance as being the cities of first importance commercially and strategically, followed by Adelaide, South Australia, Brisbane, Queensland, and Fremantle, West Australia, Tasmania necessarily being left almost entirely unprotected.

Civil Aviation

Civil aviation in Australia, as in other countries, is considered to be a very valuable adjunct to the air forces from which may be recruited men trained in the air, and the inauguration and development of civil aviation has been given some attenton here.

At a conference of Federal ministers and State premiers in May, 1920, it was agreed that the Commonwealth should introduce a bill to give effect to the convention for the regulation of air navigation signed in Paris on the 13th of October, 1919. Such a bill (the air navigation act) was introduced and became law on December 2, 1920. The civil aviation department was formed under Lieut. Col H. C. Brinsmead, O. B. E., M. C., who was appointed controller of civil aviation on December 16, 1920, and is now serving under a five-year contract. The regulations under the air navigation act were gazetted on February 11, 1921.

Among the duties of the controller of civil aviation are the following:

Advise the minister, generally, on civil aviation.
Superintend the disposition of such funds as are made available by the Parliament.
Administer the air navigation act and the regulations thereunder.
The acquisition and preparation of civil aviation landing grounds, and authorizing the use of such grounds by private interests.
The granting of contracts for the carriage of goods over approved routes. (Et cetera.)

In the matter of the administration of the air navigation act and the regulations thereunder the controller is assisted by a small technical staff, the principal officers being three superintendents, all qualified pilots, one being responsible for the examination of pilots and their work, another for aircraft and everything connected therewith, while the third is responsible for aerodromes and all ground work.

With regard to the establishment of landing grounds along approved routes attention is invited to the statement that up to the end of 1922, 55 landing grounds had been acquired or leased and prepared for civil aviation. It is believed that this number has been increased since that date. Such landing grounds have been established along the following routes:

(*a*) Adelaide to Sydney.
(*b*) Sydney to Brisbane.
(*c*) Charleville to Cloncurry (Q.).

Aerodromes at Sydney and Brisbane have been compulsorily acquired at an estimated cost of £20,000, but payment has been deferred pending further negotiations as to the amount. Preliminary surveys have been carried out along the following routes, but no expense has yet been incurred in the preparation of landing grounds:

(*a*) Melbourne to Charleville (Q.), via Cootamundra, Narromine, Bourke (N. S. W.), and Cunnamulla (Q.).
(*b*) Melbourne to Perth (W. A.).
(*c*) Adelaide to Port Lincoln (seaplanes).
(*d*) Melbourne to Hay (N. S. W.). (Yearbook No. 16.)

As an indication of the progress made in the establishment of aerial routes in Australia attention is invited to the following news clipping from the Melbourne Sun of May 15, 1924:

Officers of the department of civil aviation are calculating and charting meteorological data required by local designers and manufacturers of aircraft for civil routes.

The need for such preliminary investigation is emphasized by the abnormal climatic conditions experienced over air routes now being operated with imported airplanes.

The preparation of an air route between Charleville (Q.) and Cootamundra (N. S. W.), 925 miles, has been in hand since the latter part of 1923. Aerdromes and emergency landing grounds have been selected, and the work of clearing, leveling, and marking the surfaces has been commenced.

Starting at the Queensland end, the following landing grounds have now been prepared: Mangalore, Wyandra, Cunnamulla, Enngonia, Grass Hut, Bourke, Marooua, Wadell's Tank, Byerock, Girilambone, Nyngan, Nevertire, and Narromine.

Completion of this sector will provide an ideal airway between Cloncurry and Melbourne, a distance of over 2,000 miles.

For the purpose of gathering practical information concerning routes, landing fields, etc., for commercial purposes throughout Australia, as well as for the gathering of meteorological data of value to aviation, it may be stated that the controller of civil aviation is about to make a tour of this continent, using a land plane. This proposed trip is being delayed by reason of the fact that the plane in which the journey is contemplated has not yet been delivered by the makers in England.

The appropriations made for the promotion of civil aviation and the expenditures incurred are:

Year	Appropriation	Expenditure
1920–21	£100,000	£4,783
1921–22	71,988	36,905
1922–23	159,427	78,590

The use of the airplane for commercial enterprises or for private convenience is no doubt greatly retarded on account of the high cost of the equipment and its operation, bearing in mind that airplanes are not, to any degree, manufactured in Australia, all planes used here being almost exclusively of foreign manufacture. The activities of the Government in the use of airplanes for the delivery of mails and by private commercial interests for the carriage of passengers and freight (usually by mail contractors in conjunction with the carriage of the mails and in conformity with the terms of their contracts) are slowly expanding, although the growth of such enterprises will not reach any extent in the immediate future.

A limited number of airplanes have been imported into the Commonwealth at various times for commercial purposes, and, in this respect, attention is invited to the following item from the Melbourne Sun of May 15, 1924:

Fourteen modern airplanes will shortly be disembarked in various parts of Australia.

Some will be added to existing fleets operating air mail services; others will be used for demonstration purposes; and the remainder have been ordered by private individuals as a means of rapid transport between country centers.

Among the machines thus advised are eight four-seater commercial airplanes of the *DH–50* type, one *DH–37*—a high-performance touring machine—and five of the new light planes. Of the latter, four are of the *DH–53* type, fitted with 6-h. p. Blackburne engines; the fifth is a 6-h. p. *A. N. E. C.*

Also two light planes and a four-seater flying-boat are being constructed locally.

Military-Civil Coordination

While civil aviation, not only from the nature of its functions but as well from policy and observation, is a separate and distinct branch of aerial activity, a coordination of the development of civil and military aviation is made possible through the presence on the membership of the air council of the controller of civil aviation. Coordination, while forming the basis of discussion and agreement at the meetings of the council, is, inasmuch as these two branches of air development are independent of each other, enforced through the minister for defense, in whose department both activities are centered. Probably the closest cooperation exercised at the present time is that of the joint establishment and use of air routes and landing fields, defense routes and fields to a large extent serving equally well for the purpose of the civil branch.

Air-Mail Service

Inasmuch as the establishment of air-mail routes and the maintenance of regular schedules over certain approved airways across the continent are admittedly valuable adjuncts to the rapid development of air defense, some information concerning the activities of Australia in the carriage of air mails would appear advisable.

Contracts have been entered into by the Commonwealth Government for the establishment and maintenance of mail services by airplane over certain approved routes within Australia under subsidy from Government funds allocated for the development of civil aviation. The contractors for these services must provide and reserve space sufficient to accommodate 100 pounds of mail matter. All space other than that reserved for mails is to be at the disposal of the contractor, but the charges for the conveyance of passengers and goods must be on a scale agreed to by the Minister for Defense. The postmaster general has approved of the services being availed of for

the conveyance of first-class mail matter, provided that only such matter be carried that is superscribed for transmission by aerial service, and bears in postage stamps a special fee.

There are at the present time, so far as is known, only two air-mail routes which have been in operation for any length of time, namely: Charleville (Q.) to Cloncurry (Q.), and Geraldton (W. A.) to Derby (W. A.). Both routes maintain a weekly service, the former being over a distance of 575 miles, and the latter 1,195. These routes operate under a Government subsidy of £12,000 and £25,000, respectively.

The following routes are in contemplation, and it is believed that their early operation may be expected:

(*a*) Melbourne (V.) to Adelaide (S. A.).
(*b*) Adelaide (S. A.) to Port Lincoln (S. A.).
(*c*) Perth (W. A.) to Geraldton (W. A.)
(*d*) Melbourne (V.) to Hay (N. S. W.).
(*e*) Melbourne (V.) to Charleville (Q.).
(*f*) Brisbane (Q.) to Sydney (N. S. W.).
(*g*) Sydney (N. S. W.) to Adelaide (S. A.).

It is believed that at a later date the Adelaide to Port Lincoln route may be extended to Perth, thus completing the route across the continent.

With regard to the Geraldton-Derby route, attention is invited to the following news item from the Melbourne Argus of December 13, 1923:

It is understood that West Australian Airway (Ltd.) has been given the right to use the new ground (established by the Federal Government at Maylands on the Swan River) as a city base for the early extension of the northwest aerial mail service from Geraldton to Perth.

With reference to the Melbourne-Adelaide route attention is invited to the following news item from the Melbourne Age of May 1, 1924:

Arrangements are being made for a start with the Melbourne-Adelaide airplane service on the 2d of June next. This arrangement is subject to the approval of the Minister of Defense, who is at present in Sydney.

The above announcement by the contractors, the Larkin Aircraft Supply Co. (Ltd.), is of particular interest, in view of the long-deferred beginning of the promised aerial service.

Originally the principal machines to be used in the Adelaide-Melbourne-Sydney-Brisbane aerial services were of the Handyside construction, with a landing speed of 45 miles an hour. This type was considered by the contractors as being unsuited to the conditions of landing on Australian stations, and negotiations were entered into for the purchase of three De Haviland planes.

Word has now been received that the De Haviland machines will be delivered in Melbourne within 12 weeks.

Meanwhile, the contractors propose to inaugurate the services by the use of their present machines—a Sopwith Wallaby, a Sopwith Antelope, and a *D H-4;* an Avro and a Sopwith Gnu will also be available in an emergency.

The line from Brisbane to Adelaide, via Sydney, Cootamundra, Hay, and Mildura will, it is stated, soon be in operation. However, the lack of the overseas equipment which has been ordered will cause the line to operate for mail only for the present.

In connection with the air-mail services it is to be noted that it is the practice of the defense department to provide properly prepared landing grounds, but the contractor is required to provide hangars and workshops along the route as specified in the contract. If these are erected on the landing ground, a nominal rental is charged by the department.

While neither the air-mail services nor the use of airplanes for commercial purposes has been availed of to any extent, the excellent climatic conditions, the long distances between centers of commercial activity, and the large expanses of country devoid of mountains render Australia especially suitable for the operation of this method of transport and communication.

CHILE

NAVAL ORDNANCE SERVICE CONTRACTS FOR SERVICES OF A CAPTAIN, R. N.

June, 1924

The services of Archibald Domville, commander, British Navy (retired), have been secured by the Chilean naval authorities for the year January 1 to December 31, 1924, under the terms of the following contract. Commander Domville has served for the past two years under contract with the Chilean Navy in the capacity of instructor in ordnance and only recently retired from the British Navy in order that he might retain this position, as otherwise he would have had to return home for active service.

The following is a translation of the contract:

[Official bulletin of the Chilean Navy]

No. 328–2–IV–24.

The following contract between the director of personnel, Admiral Juan Schroders, and Capt. Archibald Domville of the British Navy is approved:

1st. Captain Domville obligates himself to serve the Chilean Government in the capacity of instructor in ordnance in the Chilean Navy, from January 1 to December 31 of the present year and to execute the orders of the naval authorities under whom he serves.

In case of war between England and another country, this contract will not remain in force, and Captain Domville will receive his return passage to London, as if the contract had been annulled for the remainder of its tenure.

2nd. It will be the duty of Captain Domville to take charge of all the material entrusted to him, in accordance with the regulations and instructions of the naval ordnance service.

3rd. During the term of this contract, Captain Domville will have the rank and privileges which, in accordance with the Chilean regulations, correspond to a "Capitân de Navio" (captain, U. S. N.), and will wear the uniform of that rank.

4th. Captain Domville will be subject to the Chilean laws, and regulations of the Navy, without being allowed any special privileges above the other officers of his rank in the Chilean Navy.

5th. Captain Domville will receive a monthly pay of one hundred and fifty pounds, sterling (£150), beginning from January 1, 1924, at the end of each month, payable in English money or in its equivalent in Chilean gold at the bank rate of exchange at the time the payment is made.

When he is assigned duty on board ship he will receive a bonus of $125 moneda corriente (Chilean paper money) per month as aide on the naval staff.

6th. When Captain Domville has to travel, under orders, from the city designated as his official residence, the Chilean Government will furnish him first-class passage by rail or by sea, and also the per diem allowance equal to that allowed officers of corresponding rank during the time he is obliged to live in a hotel.

7th. Captain Domville will have the right to the same number of days leave as is allowed Chilean naval officers.

8th. The Chilean Government will furnish Captain Domville, his wife, and his daughter first-class passage from Valparaiso to London at the expiration of this contract.

9th. The Chilean Government reserves the right to cancel this contract in case of prolonged illness or lack of compliance with its stipulations. The Government reserves the same right, if after amply investigating, in the manner customary in the case of officers of his rank in the Chilean Navy, it is found that Captain Domville is guilty of improper conduct which makes it impossible for him to continue in the service. In this case he would forfeit the right of a free return passage to London.

10th. If due to an illness of more than three months Captain Domville should be unable to comply with this contract, or should his health break completely, as certified by the doctors named by the director general of the navy, the Government will have the right to annul this contract; but in this case the right to a return passage will remain in force, as stipulated in clause eight.

11th. The Chilean Government may not under any circumstances make other payments than those mentioned above, and Captain Domville will submit in all things to Chilean jurisdiction.

12th. This contract will become null at the termination of its time unless its renewal is agreed upon three months before.

13th. The director general of the navy shall decide the indemnity to be received by Captain Domville, or his widow, in the case of his suffering an accident in the service, or if he dies or if he is so injured as to disable him from continuing further service in the navy.

14th. It is understood that any doubt or difficulty which may arise with respect to the interpretation or compliance of this contract will be decided solely and exclusively by the Chilean Minister of Marine, without any intervention of other persons, either foreign or Chilean.

The conditions of this contract are hereby approved and are not subject to any appropriation of the budget for the year.

GERMANY

FOREIGN BUSINESS ACTIVITIES OF DORNIER METAL AIRPLANE WORKS

June, 1924

The following miscellaneous notes regarding Dornier activities have been obtained from conversation with Herr Milatz, of (Luftschiff) Hallenbau, Berlin. Herr Milatz is virtually chief business adviser to Herr Dornier and is particularly interested in Herr Dornier's efforts to establish connections in foreign countries. Herr Milatz's information should therefore be reliable, and was given with apparent frankness, athough some of his remarks, particularly those regarding American business prospects, were probably cut to suit his listener.

JAPAN

Arrangements have been completed with Kawasaki Dockyard by which this concern is to build airplanes of various types to Dornier designs. German technical and shop personnel in limited number are now en route to Japan. Sample airplanes of Libelle, Comet, Dolphin, Falcon, and Wal (?) types have been purchased by Kawasaki Dockyards and are soon to be delivered. Kawasaki Dockyards has also bought sample metal airplanes from Rohrbach, Copenhagen (Rohrbach was formerly associated with Zeppelin activities), but Dornier designs are considered to be better than Rohrbach's. Part of the agreement with Kawasaki Dockyards includes a "commission" of Japanese to reside temporarily in Friedrichshafen to become familiar with methods followed here. Dornier is not impressed by the ability to absorb shown by the four or five young Japanese sent for this work, and anticipates that the Japanese builders will require considerable German assistance before they are on their feet. For this reason real building activity in Japan will not start for several months. The interest of Kawasaki Dockyards and Japanese generally in airplanes (particularly of all-metal construction) is very great. While their interest includes all types, there is very little commercial aviation in Japan, and the real interest is in military types. Engines for Dornier-Japanese types will be exported from Germany (B. M. W. type or Siemens-Halske) or from England (Rolls Royce Eagles). The Japanese are reported to be "good buyers," i. e., have plenty of money and are easy to make a contract with.

RUSSIA

The Soviet Government is greatly interested in airplanes and the dozen or so samples of Dornier commercial types already sold to them and delivered have created a favorable impression. The real interest is in military types and Herr Dornier has been invited to spend a year in Russia giving advice and assistance to one of their building plants (Moscow?). This is impossible but Herr Milatz and Herr Dornier are planning a short business trip to Russia within the next few months and hope to conclude or at least improve the prospects of a license-building agreement. The Soviet Government has plenty of money and seems willing to spend it on aviation. "Large orders" were stated to have been placed with Fokker (Amsterdam).

FRANCE

A representative of a French airplane firm started negotations for the purchase of 50 or more airplanes to be built in France to Dornier designs and under Dornier supervision. Dornier, based on alleged patriotic grounds, declined, or at least outlined impossible terms, so that the deal fell through. It was inferred that Dornier would have no objection to selling outright to France German-built or Italian-(Pisa) built airplanes.

ITALY

The Pisa plant is proceeding satisfactorily as far as building is concerned, but Italian Government orders have not materialized to the extent that was expected. Furthermore, it was indicated that the Italian interests involved adopt a "narrow-minded" attitude toward the plant and that this narrow-mindedness is carried over into the attitude of the Italian Gevernment toward the plant. The Italian Government has objected to large-scale production at Pisa of airplanes intended for foreign countries.

AMUNDSEN POLAR EXPEDITION

Regret was expressed at the financial difficulties the expedition finds itself in. However, it was asserted that Dornier had no alternative from a strictly business viewpoint except to require payment before delivery. Dornier's financial resources were represented as sound but limited and not able to risk the loss of the $70,000 needed to complete payment on the planes. If Amudsen had announced his financial troubles sooner, Herr Milatz thought he could have secured the necessary funds. Now he regards it as too late.

CENTRAL AMERICA

A number of Dornier airplanes have been sold to Central American Governments or to individuals operating in those countries. The types have been well received wherever exhibited. A representative of Colombia Republic is now at Dornier's Friedrichshafen plant awaiting the completion of a Dolphin-Comet airplane. The ability of the personnel operating Dornier planes in Central America was criticised. (This evidently by way of an alibi of an accident at Pisa several months ago in a Wal type in which a student pilot was killed and a more recent accident to a Dornier plane reported from Central America in which, however, the occupants of the plane were not injured.)

SPAIN

The Dornier planes (principally Wal type) sold to Spain have given satisfaction, but further orders are not expected as Spanish money is scarce.

U. S. A.

Herr Milatz deplored what he assumed to be facts—that the United States had no real "all-metal" airplanes and that United States interest in "all-metal" types was not enthusiastic. He considers that the advantage of the all-metal construction are best evidenced in the larger sizes of airplanes. Dornier is not tied up in the recently established Goodyear-Zeppelin Corporation although he can and may enter later. Herr Milatz indicated that he felt the airship building interests of this firm would probably overshadow any airplane interests. He believes that America is a country with a great future for aeronautics and particularly for metal-airplane building. In America one could build for any customer without governmental obstructions (cf. Pisa plant above), and if one expects United States Government orders in quantity he must build in America and build designs that fit American requirements. Herr Milatz and Herr Dornier plan a trip to the United States 6 to 12 months hence to look over the situation with a view to establishing connections there.

GENERAL

Dornier has a number of new designs on paper and is prepared to build as soon as he gets orders or works himself into a better financial position. These projected designs include various military types—notably torpedo-carrying airplanes. It was hinted that one or more of these new types were already under construction but with construction proceeding very slowly.

SPAIN

RUMORS OF DISCONTENT IN ARMY AND NAVY

July, 1924

Of late rumors have been current relative to discontent in both the army and the navy. It is stated that a plan for the reorganization of the navy was being considered by the directorate and about to be put into execution without the the Ministry of Marine and the navy having been given due consideration in the formulation of the plans. It is said that Admiral Magas, only navy member of the directorate, did not concur in making the plans and made some efforts to resign, but was dissuaded. As it was proposed to make some drastic changes involving considerable cuts in the naval establishment (with a view to economy—so necessary in order to balance the budget), the navy not only felt sore, not having been consulted, but strongly disapproved of the plans proposed.

Admiral Pintado, representing the naval forces, is said to have gone to see General Primo de Rivera, where he received little attention; he then went to see the King, who at first refused to receive him, but the admiral sent word that he came not as an individual, but as the representative of the sea forces; the King then received him, and talked with him nearly two hours.

It is rumored that the Spanish Navy was on the point of refusing to conform to the part assigned them in the reception of the King and Queen of Italy, but finally decided to conform in order to avoid the bad impression that would be created by visible disaffection upon such an occasion.

The decree for the reorganization has not yet been issued.

There is no authoritative information on this, but the persistency of the rumors leads to the belief that there is something to them.

It is also stated that there is disaffection in the army. A story is told of a row between Captain General Weyler (the only full general in the army) and Primo de Rivera, who is a lieutenant general. It seems that the president of the directorate (Primo de Rivera) reversed a decision made by the Consejo Supremo de Guerra y Marina (supreme court of war and marine) of which General Weyler is president; this made him quite angry; and he is said to have "sprung his rank" on Primo de Rivera during the more or less heated discussion they had about the case. Rumors connect General Weyler's name with the leadership of another government (to be composed of both military and civilian personnel) to replace the present directorate.

The army in Africa is said to be very dissatisfied. It is stated that Primo de Riveria's plans contemplate the withdrawal of the advance lines; this is strongly opposed by a large number of the officers in Africa.

Lieut. Col. France commanding the Foreign Legion is supposed to have refused to obey an order to abandon his advanced positions, and to have been placed in arrest as a result. The King is said to have refused to sign an order which was presented to him for France's dismissal, and France has gone to Tangier to confer with Millan Astray, the organizer and former commander of the Foreign Legion.

General Sanjurjo, the energetic commander of the Melilla zone, is also said to be out of sympathy with the present government and his name is connected with rumors about the formation of a substitute government.

It is stated that General Primo de Rivera is going to Morocco to take personal command of the forces in order to acquire the requisite service for promotion to captain general (full general).

It is claimed that the French are greatly displeased because the Spaniards are furnishing arms and munitions to Abd-El-Malek, a Moorish chief who fled from the French zone, where he was in rebellion, to the Spanish zone. The Spaniards propose to use Abd-El-Malek against Abd-El-Krim, but it seems that the French claim it is dangerous to them for Spain to put arms in the hands of Abd-El-Malek, as he may not remain willing to confine his operations to the Spanish zone.

Some importance is attached to rumors of a meeting being held in Paris between Lerroux, and Marcelino Domingo (Republican leaders), Garcia Prieto, leader of the Liberal Party and head of the government that was replaced by the directorate last September, and Sanches Guerra, head of the Conservative Party. It is stated that a great deal of scheming is on foot, the object of which is to bring about the downfall of Primo de Rivera and the return to power of old politicians.

The directorate gave out an official statement which was published in the press June 20, denying the truth of the many rumors such as these mentioned, and saying that it is useless to try to fight against the strength of public opinion which now sustains the directorate.

It is difficult to get any real information about these matters. The above rumors seem at least to have some foundation of fact behind them, and they are therefore given for what they be worth.

OFFICE OF NAVAL INTELLIGENCE
NAVY DEPARTMENT
Washington, D. C.

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In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines

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MONTHLY INFORMATION BULLETIN

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FOR CONVENIENCE IN ROUTING

Officer	Initials	Date received	Date forwarded
Captain			
Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
Engineer Officer			
Medical Officer			
Supply Officer			
First Division Officer			
Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

ADMIRAL DE ROBECK'S VIEW AS TO BATTLESHIPS, AIRCRAFT, AND SUBMARINES

The British press have given considerable prominence to the following interview with a press correspondent by Admiral Sir John de Robeck, immediately following the hauling down of his flag as commander in chief of the Atlantic Fleet, 15 August, 1924:

I am a firm believer in the battleship. Nothing that happened in the war has modified my views to the slighest extent, and in the next war the contentions of believers in battleships will be justified fully.

If we had had at the beginning of the war the appliances that we have to-day, the position of the battleship would have been from 75 to 80 per cent stronger and there would certainly have been no question of its dispensability.

There may have been hesitations because of the perfecting of aircraft or the development of submarine vessels, but they no longer operate.

In any subsequent war it will be found that the submarine menace that was experienced during the war has gone; the dangers to underwater craft will be too great to permit of such vessels being operated to any great extent.

The battleship, more than ever, is the vessel to be reckoned with, and we ought not to forget to what a low ebb our fleet has been reduced. In the recent review at Spithead we had 10 battleships, whereas at the review in 1914 we had 55; it is true that some of the latter were old, but they were valuable.

To-day, if there is any consolation, it is that in the strength of the fleet we have got down to bedrock. Yet there is another consolation, too, and it is to be found in the spirit of the navy. It has never been better than it is now, and exceedingly high efficiency is the characteristic. The navy has recovered its former self to an extent that is really noteworthy, and the only misfortune is that promotion is too slow for both officers and men.

GREAT BRITAIN

REPORT OF VISIT TO BRITISH NAVAL ACADEMY

Report submitted by a Midshipman on the Practice Cruise

The Royal Naval College is situated on one of the best and safest harbors in England. A narrow, deep entrance formed by the River Dart and the English Channel bends sharply, leading into a well-formed natural harbor deep enough for the largest vessels. The college is perched on a high hill directly above, with no protection or fortification of any kind. The ontstanding mark of the countryside, it would be very vulnerable to airplanes or to ships standing off in the channel.

The college is formed by a long main building with wings on each end and in the center. The mess hall is located in one side wing and the chapel in the other. To the rear and connected is another long group built during the war. The store, all official offices, shoe shop, etc., are all in the main building.

Until 1903 the college was located on the *Brittania*, anchored in the river at Dartmouth. The present college was then started, with two years for the younger boys at Osborne, Isle of Wight, and two finishing years at Dartmouth. Since the war the Osborne school has been discontinued, the younger, or junior, college boys being quartered in the new group.

The course is four years in length, divided up into 11 terms of three months each. There is a group of about 50 entering every three months, at which time the senior group, or term, as they are called, graduates. Entrants must be between the ages of 13 years and 4 months and 13 years and 8 months, this great similarity of age giving homogeneity in physical, mental, and educational qualities and making more uniform the final product four years later. Upon entering, each term is assigned the name of some famous admiral, such as "Rodney," "Drake," "Duncan," etc., by which name they are known for the remainder of their career in the college. In order to educate them to the idea of seniority and the value of rank, each term is a unit in itself, and absolutely no intermingling is allowed between different terms. Also, as each three months pass and the term goes up one in the scale, its advanced position is awarded by increased privileges.

In entering, all candidates first go before an interviewing board of naval officers. In an entirely informal way a number of common-sense questions are asked. Those passing this test, and by far the greater number fail here, are required to pass a "medical" and then an easy written examination in common-school subjects.

Each of the terms has a sleeping room with the cots arranged in rows and a sea-chest locker at the foot of each bed. The cadets only sleep here, studying being carried out in the separate "gun rooms" assigned to each term. Every man has a small locker in his gun room where writing material, reading material, and study books are kept. The neatness of the "gun rooms" is accountable to the cadets themselves, but in their sleeping quarters and changing rooms they have personal servants.

Civilian instructors, termed masters, are employed to give instruction in the classroom, whereas naval officers are in charge of discipline, sports, and purely naval subjects. A captain is in charge of the college, his executive officer is a commander, and to each pair of terms (one in the senior and one in the junior colleges) there is assigned a naval officer, who has command of his two terms, dis-

ciplining them, arranging their games, carrying out official business, etc.

In the course of their work there is very little preparation for any study, nearly all their work being of the practical or notebook style. Instruction is of the type of a very thorough and constantly repeated explanation, which seems to succeed extraordinarily well. Any study hours given are employed in collecting notes, preparation for examinations, or the occasional preparation of some such subject as French. Of the latter it is interesting to note that the last 10 minutes of each class are turned over to the students for the perusal of French pictorial and illustrated comic magazines, of which a supply is kept in the classroom.

The subjects studied at the college are: Mathematics, geometrical drawing, mechanics, physics, chemistry, engineering and mechanical drawing, navigation, seamanship, French, English, history, biography, and physical training.

The control of the cadet organization of the college is almost entirely in the hands of the senior or "Duncan" term. They draw up a list of a hundred or so privileges or restrictions desired, and the commander makes these official by his signature.

From this term are selected two chief cadet captains (C. C. C.), one in command of the senior and the other in command of the junior college. At "Divisions" in the morning and at other formations these two men take charge, while the mustering and reporting of the different terms is carried out by cadet term captains, likewise chosen from the Duncan term. There is no infantry drill of any sort, yet each of the cadets is a model in snap, form, and precision, and every formation is cleanly and quickly carried out. During the day the term captains with assistant cadet captains have charge of cleanliness of the gun rooms and the general conduct of their terms. At meals they muster and conduct their terms on the double to the mess room where the chief cadet captain renders prayers and rings bell for seats. The food furnished is good and substantial, somewhat better than that served at our own naval academy. In the evening after studies there is an assembly on the "quarter-deck," in the inside formation floor and dancing hall. After chapel there are a few minutes of dancing and then "retire." The term captains turn in their terms, regulate windows for a temperature around 60°, and then stand by for inspection by chief cadet captain. After this preliminary inspection the commander and the chief cadet captain make the rounds again. The term captains were all close friends of the chief cadet captain, yet I did not notice any less respect or military bearing in their attitude toward him alone than toward both the commander and him.

Punishment for offenses in the different departments is obtained by assigning additional work in those departments. Any infractions of other rules are punished by deprivation of pocket money, 1 hour per week leave, etc., or by punishment administered with a cane by the chief cadet captain. An insight into the character of the boys is obtained by their attitude toward these whippings. The chief cadet captain is just as impartial in the beating of his friends as that of anyone else, and they expect this on his part, respecting and liking him all the more for it.

There are 15 acres of ground devoted to rugby, cricket, tennis, track, etc.; with a gymnasium and private tutors for swimming, fencing, boxing, and other sports. A high interest in games is gained by numerous trophies and awards given for interterm competitions. In addition, each man must engage in a certain sport, according to a regular schedule, every afternoon between 4.30 and 6.30.

In the evening, in order to develop yet another side of their character, each boy is required to take up some special subject or pastime under a private tutor, which in time develops into a personal hobby.

In order to develop self-control and confidence the boys are early assigned responsible positions, in charge of boats, etc., and are made to depend upon themselves in as great a way as possible.

The personal expenses of the cadets are paid by their parents with an additional sum of £150 per year as a part of their college expenses. In case any cadet is withdrawn his parents are liable to a charge of £40 per term spent by him in the college.

There are 7 weeks holiday in midsummer, 4 weeks at Christmas, and 4 at Easter, with half holidays on Wednesday and Saturday, and one full holiday each term.

The passing out examinations for the senior term are averaged with their other marks to assign them to first, second, or third classes. First class means 2 months and second class 1 month earlier promotion from midshipman to sublieutenant. Pay for cadets at the college is nothing. Upon graduating they go into the fleet for 6 or 8 months as cadets with a pay of 1 shilling per day, parents being required to furnish allowance and outfit. Upon promotion to midshipman their pay is raised to 5 shillings per day. They remain midshipmen in the fleet for two years and are then promoted to sublieutenants.

I was accorded the greatest courtesy and assistance while at the college, being quartered with the cadets and having the commander's messenger to conduct me around to the various classes during the day when the cadets were occupied with their studies.

GREAT BRITAIN

NOTES ON VISIT TO SHIPS OF BRITISH SPECIAL SERVICE SQUADRON

July, 1924

I went aboard the *Delhi* about 4 miles north of San Francisco Lightship. The squadron was lying to awaiting a favorable tide, and went ahead in time to reach the anchorage by 1,700 at speed 10 knots, later changed to 9 knots. The officers on the *Delhi* would have preferred a higher speed. The ships were in column of division guides, divisions in line of bearing, the *Adelaide* in the leading division, with the *Hood* and *Repulse*. The station keeping was average, but was made hard by stopping and proceeding at low speed. Before entering Bonita Channel column was formed in the following order: *Hood*, *Repulse*, *Delhi*, *Danae*, *Dauntless*, *Dragon*, and *Adelaide*.

These vessels had run at 16 knots during the trip from Juan de Fuca Straits, but usually make 12 knots on cruising.

The Battenberg course indicator is used in maneuvering. There is no steering station on the bridge where the officer of the deck stands his watch, but the steering is done from a station below decks in the conning tower on the battle cruisers. Conning is done through voice tubes, which are large and are insulated. A steering station on the deck below the bridge had been turned into a small cabin for the admiral and the steering wheel removed.

One of the officers said they found it very hard to maneuver with the battle cruisers on account of the difference in turning circles and in the time taken to change speed. They had to use 15° of rudder instead of the usual 30°.

No ships were as clean as ours in detail. The *Hood* was particularly cleaned up, with an extra cleaning allowance for this cruise, but she was not clean in details, though she made an excellent appearance in general view and on main decks frequented by visitors.

The captain's quarters are more homelike than ours, having better furniture, rugs, hangings, and decorations. A captain may replace anything which has been in use two years or is in bad condition. He is given an allowance and may select cabin equipment at certain stores in England.

They have very poor accommodations for the chief petty officers. Petty officers were slovenly and not clean, particularly in their quarters (partitioned off from main living compartments by canvas curtains); they were in shirt sleeves and were not to be distinguished from other men.

Men get but one full ration meal, containing meat and vegetables, a day. Breakfast, supper, and tea only provided in such rations as

sugar, coffee, etc. Men purchase most of their food for breakfast and supper and are allowed to have it cooked in the galley.

Men's uniforms gave appearance of being cheap. Much civilian clothing was in evidence.

British officers were all impressed with our open-deck spaces throughout the ship. Their decks are crowded and badly cut up with obstacles in comparison.

Captains and commanders were surprised with our examinations for promotion. They have none above lieutenant commander.

Their paint and varnish is much superior to ours. Upper deck bulkheads near quarterdeck and in certain parts of ship are enameled.

The ship's service telephones are of poor design and are little used.

The broadside guns on the *Hood* are 5.5-inch manufactured by Vickers.

The maximum elevation shown on the sights is 1,925, presumably minutes. This seems excessive, but the guns are mounted so that the breech is very high off the deck. A shell tray is fitted on bracket arms at the breech, so fitted with cams as to swing into place in line with bore when plug is opened, its axis being kept parallel to axis of gun at all times.

The control is by Vickers gear the same as ours. The selective switch has three positions, director 1 and 2 and individual. For full charge the muzzle velocity is 2,725 foot-seconds and for reduced charge 2,450.

The recoil mechanism is hydraulic, counterrecoil compressed air. Instructions are to charge cylinders to 475 pounds and not to operate below 425 pounds.

The trainer's position has an Evershed training indicator. The deflection scales are marked in knots, 75 right and left. They will not repeat the triple mount 4-inch carriage installed on the *Repulse*.

Much importance is given torpedoes on their large ships. The *Repulse* holds five torpedo practices a year. Two commissioned officers, one a lieutenant commander, and four midshipmen are assigned to torpedo duty.

There are four torpedo tubes on the *Hood*. Two on each side amidships about 5 feet above the water line. They appeared smaller than ours, both in diameter and length.

One of the gunnery officers did not seem to understand what curved fire meant.

The antiaircraft guns are 4-inch, using a 31-pound projectile. The trainer has an Evershed training indicator. Telescopes were not in holders and there were no indications that instruments for director fire are used. Deflection scales are in "knots" right and left. A small dial is provided on the pointer's sight mechanism

marked "up" and "down" but it could not be ascertained what the graduations were. Presumably the spotting corrections in elevation are applied at the gun.

These guns appear to be heavier than ours and to have heavier mounts than ours, as compared to our 4-inch guns. Five guns were noted, one on each side of the upper deck and three on the center line.

One officer said they were still undecided as to what caliber is most effective. They have used 1-pounder and 3-inch.

There are but two main director stations, the top and fire-control tower.

Evershed searchlight control is not satisfactory.

The *Hood* has a 30-inch range finder in each turret and one in the conning tower. Those in the turrets are reported unsatisfactory due to excessive vibration. They have a 15-inch one in the foretop and two 9-inch range finders in the wings of top. There is a 15-inch range finder on each side of the stacks for the broadside.

Stereoscopic range finders are not used.

There are four decks in the conning tower, the upper for the admiral, then the fire-control officer, the captain, and below him the torpedo officer. The part for the captain was the only part visited. It is around a central tube which takes up most of the room of the conning tower. The eye ports are very much longer than ours. There is not as much room in the part for the captain as in ours.

Target practices are held quarterly with leave periods between the spring and fall practices. Three-pounder subcaliber guns are used extensively for training. Competition is between divisions and squadrons, rather than between ships. Very few target practices are held in which a target is fired at, but ships are used as targets and the sights are offset. Splashes are raked from the target ship but no photographs are taken, either moving or still.

Ranges are between 10,000 and 16,000 yards except for a short range practice when the range is 2,000 yards.

All the practices conducted around Australia are held north of Sidney in the immediate vicinity of Brisbane.

They have no satisfactory targets for antiaircraft guns but fire at shrapnel bursts.

The British have four officers in their turrets as follows:

Turret officer.—In sound-proof booth, no vision into turret chamber. Mission: To keep turret on target, maintain plot in conjunction with main plotting room, and stand-by for isolation of turret and independent control. He has a separate entrance from deck.

Loading officer.—On platform between guns, the turret chamber is entirely open. Sole mission: Loading.

Upper handling-room officer and lower handling-room officer.—Handling room officers may be relieved by leading petty officer by special authority but this is seldom done.

The officer in command of the turret is not below the grade of senior lieutenant.

The booth has sighting slits instead of a periscope.

The turrets use hydraulic system entirely. The gas-ejection pressure for major caliber guns is 1,000 pounds per square inch. The gauge showed 3,000 pounds, but pressure is reduced between gauge and bore. The air blast made loud, shrill blast much louder than in our turrets. Some turrets also have water jets which they consider essential.

They have only 14 men in the loading crew of the *Hood's* two-gun turrets a total of about 50. The powder and shell come up in the same car. Other types of turrets have shell hoists similar to ours. Guns are loaded alternately and must be brought to loading position. It takes 17 seconds to get a shell from handling room to guns.

Apparently the gun ready light is turned on automatically when gun is ready to fire.

They have installed an elaborate flame-proof shutter system since the Battle of Jutland.

A petty officer stated that they never fired into the wind during target practice as a flareback once occurred, caused by flame of firing gun blowing down bore of other gun which was being loaded.

All turret guns are loaded and fired independently. Four gun salvos are used (one gun in each turret). The salvo interval is between 25 and 35 seconds. The secondary battery sometimes is fired with the main battery. The range of the secondary battery (5.5-inch) is extreme 18,000 yards; effective, 8,000 to 10,000 yards. The Evershed system is installed at some antiaircraft and broadside guns but condemned as absolutely unreliable. The *Hood* has made hits at 33,000 yards, firing at an ex-German ship. The range finder in the top was used and an airplane spotting. A commander stated that they did not see the use of indirect firing as proper procedure was to close action and sight target.

A chief petty officer said that the range was plotted on a paper moving at 2 inches per minute and the mean sent to the guns. He mentioned the follow-the-pointer in train, but stated that elevation was by phone. He also said that most of their first salvos were "on."

There are no markings on the outside of turrets to show how they are training. Ranges and bearings are sent by radio.

A petty officer stated that data for antiaircraft firing was determined on top of the superstructure just forward of No. 3 turret. He indicated that an instrument ran from side to side, athwartships on

top, and was used for determining altitude or elevation of the planes. He stated that it took five minutes to work out the data for controlling the guns.

The complement of the *Repulse* is 1,300. The commander said he was hard pressed and under no circumstances could afford all the special details we use, such as barbers, etc. He said no men could be excused from general ships work except at restricted hours.

British ships have no laundries but their officers are in favor of them and were much interested inspecting ours, in detail, both material and operation.

There are 200 marines on the *Hood*. They man two turrets. There are 110 on the *Repulse* and they man one turret. The small marine guard on the *Delhi* man the antiaircraft battery of two 3-inch guns.

Airplane flares have been used but apparently with little success, due to difficulty in obtaining silhouette effect.

They do not use condensate pumps, but use air pumps and Parsons augmenters. Air pumps and most others throughout the ship are weir pumps.

The deck winches are Waterbury drive. A ends below and B ends at winch (observation).

He stated that Diesel engines are used for generators but did not say how many they had.

GREAT BRITAIN

AVIATION

Report of Visit to Royal Air Force Base Calshot

A visit was made to the Royal Air Force base at Calshot on 11 August, 1924. This base is a large station located on the point running out from the west shore of Southampton water at its southern end. It is 18 miles by rail from Southampton, the nearest railway connection. The road is bad and water transportation is used almost exclusively both for freight and passengers. The hangars, workshops, storerooms, offices, power plant, etc., are located on the spit, while officers' and men's quarters are located on higher ground about one-half mile to the westward. The intervening area is low, marshy land, but there is a good road between the two groups of buildings.

The main hangar consists of a building about 130 feet wide and 600 feet long. It is located parallel to the long axis of the spit, the runways extending down on each side so that it is possible to launch or take in seaplanes in practically all conditions of wind and tide. The storehouses and workshops are ample in size and equipment. The power plant is a duplicate of the plant at Lee-on-Solent.

It contains three heavy oil generators. Calshot Castle, erected during the reign of Henry III and built of stone taken from Beaulieu Abbey, stands at the extreme eastern point of the station and is used as an armory and for classrooms. The station has an excellent dock and is well equipped with boats. A line of six seaplane moorings is laid out in the bight to the north of the spit. This position affords unusually good protection, but owing to the large capacity of the hangars and the ease with which seaplanes can be brought in, they are seldom moored out except for very short periods. Officers' quarters are of war-time construction. They are very large and very comfortably furnished. The men's quarters are of the single story hut type.

The complement of the station consists of 41 officers and 410 men. This complement includes the personnel of flight No. 480 composed of 6 *F–5s* and available for general naval uses. The seaplane complement consists of 12 *F–5s*, of which 6 are in flight No. 480, and of 2 Fairey III Ds. Of the remaining 6 *F–5s*, four compose a section used for the training of naval observers sent there from Lee-on-Solent, and two are used for general instruction and station flying. All the seaplanes appeared to be in very good condition. A considerable number had been very recently overhauled at the works of the Saunders Boat Co. at Cowes on the Isle of Wight. With the exception of the power plants, which were in all cases Rolls-Royce Eagle *8s*, the only marked difference between the design of these *F–5s* from the American *F–5–Ls* was in the rudder. The Calshot *F–5s* all had the balance area at the middle of the forward edge of the main rudder, operating in a rectangular cut-out place in the vertical fin instead of having the American arrangement of the balance at the top of the rudder. A short flight was made in one of the Calshot *F–5s* for purposes of comparison. They are obviously underpowdered, but are able to take off fairly heavily loaded on account of the geared engines and large propellers. Considerable trouble is still being experienced with the Rolls reduction gear. The present practice calls for the overhaul of engines every 80 hours, but it was gathered from discussions that in spite of this fact they have a considerable number of gear failures and consequent forced landings. The *F–5s* were equipped with an ingenious arrangement for facilitating picking up moorings. Each plane carried a 3-inch mooring line, the inner end of which was secured inside the forward cockpit and on the outer of which was lashed a special boat hook. The end of this boat hook had a fitting like a large harness snap, the distance across the snap being about 5 inches. When the end of the hook was thrown over the mooring loop it snapped into this loop, and the seaplane was then thoroughly secured and the pendant of the mooring could be easily shackled to the pendant carried at the bow

of the *F–5*. An improved design of this arrangement has been worked out and is being constructed, in which the hook is so made that by pulling a lead extending up through the center of the boat hook, the hook at the end can be tripped at will. It was gathered that the device was something like a pelican hook. Drogues were carried in all *F–5s* and are almost invariably used in picking up and mooring. The operation is comparatively simple when drogues are used even though a strong wind may be blowing. A demonstration of drogues in picking up and casting off moorings was given.

The present missions of the station are:

(1) A base for flight No. 480 which operates with the fleet from time to time.

(2) Training of naval observers in navigation.

(3) Training of air force officers in big-boat flying.

It was stated that flight No. 480 operated with the fleet on average of about once a month, this operation consisting of scouting, reconnaissance, defense against submarines and destroyers, reconnaissance in cooperation with submarines against the fleet, and a certain amount of bombing against the fleet. Very few long trips are made. When asked as to the experience in regard to the fouling of hulls during mooring out, it was stated that they were never moored out long enough, and the general conclusion was drawn that this big boat flight does not operate in anything like the extensive manner that the United States naval big boats do.

It was difficult to obtain much information of value regarding the methods of training naval observers in aerial navigation. It was stated that the instructors in that course were all on leave and that there was no one on the station who really knew sufficient about the subject to discuss it intelligently. The equipment of the navigational training planes was more or less obsolete. Except for one dead-beat compass under service test, the compass equipment was of the old vertical card type. Wimperis bomb sights were used for drift indicators. Sextants were said to be of little value except for star sights. A chance was had to see the instruments in the lecture room. Some of these instruments were of new type, but no one could explain exactly how they worked or how efficient they were. A Royal Air Force bubble sextant was seen. It bore the date 1919, and the impression one got from examining it was that the designer simply endeavored to build an instrument which in no way looked like the ordinary sextant, and no reason could be seen for such extreme variation from normal design. The bubble was completely inclosed, and no one seemed to care to take the responsibility of opening up the instrument. The bubble appeared to act entirely too quickly for any accurate observations from a moving platform. The gradua-

tions were on the periphery b, a 4-inch dial. A new drift-indicating instrument designed by Major Wimperis was also seen. This instrument did not appear to possess any specially good features, and its mechanical construction was very bad. A new dead-beat compass, designed by the Naval Observatory, was seen. It appeared superior to the type of which 12 were shipped to the United States Naval Observatory last year. Efforts will be made to get a complete description of this instrument and to ascertain if samples can be purchased.

GENERAL IMPRESSIONS

The general impression gained was that Calshot is an excellently equipped and extremely well located station. It did not appear from discussions that full use was being made of the station, and the blame for that seemed to be on the navy rather than the air force.

GREAT BRITAIN

AVIATION

Report of Visit to School of Naval Cooperation

The School of Naval Cooperation at Lee-on-Solent was visited on 11th August, 1924. This station is located 75 miles from London on the east shore of Southampton water. It has no direct railway connection, the nearest main-line station being Fareham 6 miles away.

The air station comprises a rather small area, and the buildings are principally of war-time construction of a semipermanent nature. The storehouse and the power plant, each of permanent brick construction, were completed about two years ago. The power plant is capable of furnishing power for a station at least four times as large as the present station, which may indicate plans for further expansion. The hangars are three in number, each capable of housing about 10 *Fairey III D* type seaplanes. The shops are ample in size and sufficiently equipped to do ordinary repair and overhaul work. In accordance with the policy of the Air Ministry, seaplanes requiring complete overhaul are returned to the manufacturers for that purpose. The officers' quarters consist of a rather large brick building formerly used as a civilian school for boys. The men's quarters consist of long, single-story huts each capable of housing 17 men. No central heating plant exists. The water supply is from a municipal source, but the station has a large, elevated reserve tank. There are two concrete runways each having at the top an electric wench for hauling out the planes. The rise and fall of the tide averages

about 12 feet, and at low tide the end of the runway is uncovered. Planes can, therefore, be launched and brought in only under favorable tidal conditions. The location of the beach is such that it is normally a lee shore and the handling of planes is difficult in winds of over 15 miles an hour.

The mission of the station is the training of naval officers in aerial reconnaissance. It also has the mission of being a base for fleet reconnaissance flight No. 444 consisting of six *Fairey III D* seaplanes. These seaplanes and their personnel are exclusive of the complement of the station itself. These officers are detailed from the Navy for this training. The course lasts about 10 months, 1 month of which consists of school training, 6 months of aerial reconnaissance, wireless telegraphy, and aerial navigation, and 3 months of aerial gunnery, torpedo work, and spotting. The aerial reconnaissance and wireless telegraphy training is done at Lee-on-Solent; the aerial navigation training is done at Calshot while the officers are still attached to Lee-on-Solent. The present class consists of 10 officers.

The complement of the station consists of 16 officers and 151 men exclusive of group headquarters (located on this station) and of officers under training. The seaplane complement consists of 12 *Fairey III Ds*, all but 3 of which are 3-seaters. These 3 are 2-seaters and are used for flying instruction purposes.

The training course did not seem particularly well organized nor did the equipment seem very complete. From what could be learned from conversation with the commanding officer and with the escorting officer, it appeared that the system was one-half of lectures and ground instruction and one-half practical experience in the air. The ground instruction included wireless telegraphy, aerial navigation and the instruments in connection therewith, signaling, and a certain amount of doctrine and a limited amount of training on the spotting board. The training in the air consisted of taking the observer out in the plane and requiring him to do observation and make the reports and to do navigation. Practically all the navigation, however, is done in *F–5s* from Calshot. The observer flies in the rear seat of the *III D;* a wireless operator flies in the middle seat and receives all reports and makes routine reports. The observer has a wireless key in his cockpit for sending. The equipment of the observer's cockpit are very meager. It consists solely of the aforesaid wireless key, a flare holder, a compass, and a bearing plate. Both the compass and the bearing plate were of old style and were badly mounted. No attempt is made to train pilots and observers or observers and wireless operators as teams. The wireless operators have received pre-

vions training at the wireless school and are present at Lee-on-Solent simply for communication purposes.

GENERAL IMPRESSIONS

As the visit was made during a leave period, the station was practically inoperative and it was difficult to form any opinion of its efficiency. The planes, grounds, and equipment were clean and appeared to be in good order. It does not seem that the amount of training done at this station really justifies its existence as no reason could be seen why this training could not be done equally well at Calshot. Calshot would also appear to be a better base for flight No. 444, as there is no boat landing within three-eighths of a mile of Lee-on-Solent, and holding communication between a ship and that station must be slow and difficult. Every courtesy was shown during the visit, but, as is frequently the case on these trips of inspection, the officer detailed for purposes of escort did not appear thoroughly familiar with the details of the course of training, and definite information was difficult to obtain.

JAPAN

AVIATION

Bombing of Iwami

No details have yet been obtained in regard to the bombing except the following press article:

The battleship *Iwami* was sunk by aerial bombs off the coast of Sagami Wednesday afternoon in the presence of army and navy officers, foreign representatives, high Government officials, and the members of both houses of the Diet, in conformity with the scrapping agreement reached at the Washington Conference.

The sinking of the old warship was highly dramatic and touched with pathos. A solemn farewell ceremony was held for the doomed vessel before it was towed out to the spot which had been selected as its final resting place, and naval bands played as it sank out of sight beneath the waves.

The *Iwami*, 13,000 tons, was one of the ships captured from the Russians in the memorable sea fight on the Japan Sea during the Russo-Japanese War. During the World War the *Iwami* was one of the fleet directed against the German Navy in Tsingtao.

The warship *Asahi* towed the *Iwami* out from Yokosuka naval station at 4 o'clock Wednesday morning to a spot some 10 miles southwest of Jogashima. At 8 o'clock the warship *Aso* and the destroyers *Shiokaze* and *Urakaze* left the naval station with those who were to observe the aerial attack.

The doomed ship was anchored in place at noon and a message was sent to the Oppama naval aviation station announcing that all was ready for the experiment. Soon after four naval airplanes appeared over the ship and, after circling once, they started dropping bombs.

The first bomb missed the ship, but the second one found its mark on the foredeck with a tremendous explosion. The planes circled around again and launched a second attack. The aim of the aviators improved and more bombs struck the blazing hull.

As the high explosives crashed into the bridge, deck, and rear of the ship, columns of smoke would belch up and the detonations were tremendous. At 4.20 o'clock the ship began to settle, some of the missiles having opened holes in the hull. In another hour the waves began to wash the deck and the battleship sank slowly.

A few minutes later it rolled over on one side in what seemed to be a death struggle. One airplane circled back, and swooping down released the last bomb. The shell sped straight and true, striking the sinking ship in the upturned side.

As tongues of fire leaped through the holes made by the bomb, the *Iwami* stirred slightly and slipped under the waves to the bottom of the sea, while the bands on the destroyers struck up "At the Risk of Life."

NEW ASTRA DIRIGIBLE

According to the Japanese press, the parts for the *Astra* dirigible which were shipped from France arrived at Kasumigaura sometime ago and has been assembled. The capacity of the bag is 10,000 cubic feet. Trials will be held before long.

The *S. S. No. 4* dirigible, which is under construction, will shortly be completed.

STATEMENT BY MINISTER OF THE NAVY ON AVIATION

Herewith is a press report of a statement made by the Minister of the Navy to the press on June 28, 1924:

While I am not certain that further economy in the expenditure for naval administration can be effected, I am of the opinion that some saving might be made in naval arsenals, for the heads of which young and talented officers have recently been appointed.

The expansion of the flying corps is of urgent necessity, and the naval authorities propose to employ the money saved in other directions for this purpose. The naval flying corps consists of 11½ squadrons at present, and under the present program the number is to be increased to 17 by the fiscal year of 1928. There will be an increase of 2½ by the end of the next fiscal year, but the necessary funds can not perhaps be provided by economy of expenses only. The minister further remarked that a recent issue of the London Times publishes an article in which it was predicted that in five years' time the British Navy would become inferior to the Japanese Navy.

There are pessimists in all countries, however. In Japan there were a good many such people after the Sino-Japanese War and after the Russo-Japanese War. The minister said he was an optimist.

JAPAN

OIL PRODUCTION IN SAGHALIEN

Information has been obtained that the Japanese Army desires evacuation of Saghalien on account of the cost but that the Japanese Navy objects to relinquishing the oil fields. Informant stated that the present production at Oha is 350 koku per day and that this year 15,000 tons will be produced.

It was also stated that—

(A) The total storage at Oha is 5,000 tons, 2,000 tons of which is tankage and the remainder reservoir.

(B) During 1924 it is contemplated that 15,000 tons of tankage will be built at Oha, the tanks costing ¥52,700 for each of three tanks have been ordered at Nagaoka Iron Works.

(C) During 1925 a sea loading line will be built.

(D) At Nutorvo there is an absorption type gasoline plant of 1,000,000 cubic feet per day (1 gallon of gasoline per 1,000 cubic feet gas).

(E) It is believed that the oil deposit is not extensive and that the cost of production is excessive for commercial purposes; also that the ice in winter and mosquitoes in summer make production very difficult. However, they state that as a matter of resources for the Japanese Navy, the Saghalien field is very valuable.

JAPAN

MISCELLANEOUS NOTES

July, 1924

The following is an extract from the Japanese press on the sinking of the *Hizen:*

On July 25th the *Hizen* was towed out to Bungo Channel by the special service ship *Setta*, followed by ships of the combined fleet, and upon arrival at the place which had been selected for the sinking of the *Hizen* the tow lines were cast off, and at 8 o'clock p. m. the *Kongo* and *Hiei* of the second fleet and the first destroyer division, with the aid of searchlights and illuminating bombs, began firing simultaneously. The *Kongo* and *Hiei* fired their 15 cm. guns while the destroyers fired Fish torpedoes. At 10:20 p. m. the *Hizen* burst into flame and she sank in 10 minutes. High ranking naval officials witnessed the sinking.

According to the Japanese press, the *Tsugaru* foundered after being bombarded by six naval planes May 27, 1924, off the Otaki, reclaimed land in Yokosuka. Many high officials witnessed the bombardment from on board the ships *Asahi* and *Aso*.

At 10 o'clock in the morning the six naval planes took off from the airplane carrier *Hosho* lying in Yokosuka and hovered above

the *Tsugaru*. The first bomb was dropped from an altitude of 1,000 meters, after which many bombs were dropped in rapid succession upon the ill-fated ship.

Finally the torpedo boat *Kamome* discharged a torpedo against the *Tsugaru* at a point 400 meters off the ship. A mechanical mine especially installed on the *Tsugaru* was exploded by the impact, and with a deafening detonation the ship was split in two amidships.

The *Tsugaru* was formerly known as the Russian battleship *Variada*, and was captured by the Japanese Navy in the Battle of Tsushima 19 years ago.

According to the Japanese press, the food-supply ship *Mamiya*, which has been under equipment at Kobe, has been completed.

She has all modern equipments, including a large refrigerating plant, stalls for livestock, slaughterhouse, etc. She is also equipped for storing of water and fuel.

The *Mamiya* will shortly be put in commission and assigned to the first fleet and will take part in the coming grand maneuvers.

According to the Japanese press, the stabilizer which was installed on the *Hosho*, having proved successful, the Japanese have decided to install them on cruisers and destroyers as well as airplane depot ships.

The following is an extract from the Japanese press:

Japanese naval authorities are studying plans for carrying airplanes on submarines.

The navy department has purchased from abroad a plane for experimental purposes. It is a small one, with a 70-horsepower engine. The wings can be folded, making the plane one-third of the original size. It does not weigh more than 480 pounds. The craft is of the reconnoitering type.

It is said that the submarine capable of carrying this plane must have 900 tons or more displacement.

According to the Japanese press, the *Settsu*, which has for some time been undergoing alterations to equip her for towing vessel, has recently been completed.

On July 4 she proceeded to Terashima Channel to take up her duty with the fleet.

HIGHEST ALTITUDE RECORD TO BE MADE

Tokyo, July 7.—The Tokorozawa aviation authorities have decided to try to make a record altitude flight. Preparations for the flight are now in progress under the superintendence of Major Shimiya.

According to the anthorities concerned, an attempt will be made during July to rise above 5,000 meters in a specially prepared balloon which will be of 800 cubic meters capacity and carry one surgeon and two observation officers. The balloon will be equipped with oxygen inhalers, parachutes, and all other necessary apparatus.

ANTIAIRCRAFT OPERATIONS

Tokyo, July 23.—The local press reports that for five days beginning August 11, a series of systematized exercises intended for the training of troops in operations against enemy airplanes on the wing, will be held near Kyoto, the first of the kind ever made in this country.

The maneuver will take place at the military parade ground in Nagatamura on the outskirts of Kyoto, and a combined force of the 8th and 37th Regiments including artillery, cavalry, engineers, and commisariats, and the Kagamigahara Aviation Corps will take part.

The exercise will give the authorities and the troops an opportunity for the study of practical cooperation between the air forces and the troops by means of signals and radios, and strategical plan of campaign in airplane attack. During this maneuver the newly invented airplane machine guns will be put to experiment.

EXTENDED FLIGHT

Tokyo, July 24.—Japanese civilian aviators are very anxious to follow the American and British example and to accomplish a round-the-world flight if only financial circumstances permit them such an attempt. Under the joint auspices of the Government and civilian aviation authorities, efforts will be made in the near future, according to a vernacular news agency, to prepare for such an ambitious flight.

A plan is announced by Mr. Yukichi Goto, a celebrated civilian aviator, to make a flight around the Japanese Empire.

Mr. Goto left Osaka yesterday morning for Kagoshima in the Osaka Mainchi machine *Harukaze* (Spring Zephyr). From Kagoshima the aviator will fly to Fukuoka, then Fusan, Seoul, Dairen, Nagasaki, and next to Kanazawa, Muroran in Hokkaido, Kasumigaura, Tokorozawa, Kagamigahara, and back to Osaka.

The military, naval, and civilian aviation services will afford the first Japanese aviator on this round-the-Empire flight every facility and encouragement.

JAPAN

REPORT OF VISIT TO JAPANESE DESTROYER

Material.—The ship appeared to be in poor material condition. She was very dirty and unshipshape, showing the result of an apparently total lack of appreciation of regularity and cleanliness. This

is probably due to the fact that the ship had just been transferred from reserve commission, and the crew consequently somewhat inexperienced.

Outwardly the ship looked staunch and well built. The frames were spaced about 20 inches, but were light, with no bulbing. The decks were of about 5-pound plate, galvanized and covered along the runways with very heavy linoleum (stated to be very slippery in rough weather). The loading areas about guns and tubes were set with staggered iron strips to prevent slipping.

Electric-light fixtures below decks were not generally water-tight. All wires were single conductor, covered with a thin lead coat and very susceptible to damage by fire.

The crew's quarters were quite dirty and unshipshape. Lockers, cabinets, boxes, and several partitioning bulkheads were of wood and very combustible.

The wardroom and officers' quarters were fitted with wooden furniture and fittings throughout.

No sheet-metal lagging nor cork insulating paint were used against the skin of the ship.

Engineering.—No data was obtained on speed or radius.

The engines are installed in a single engine room. The main bearings are all below the floor plates, dirty and subject to corrosion. The steam lines overhead were twisted and kinked to such an extent as to make repairs to joints almost impossible.

The steering engine is located in the engine room. Power is transmitted to the rudder yoke worm by a 3-inch shaft made flexible by universal joints.

The *Tokitsukaze* has four boilers, one of which burns coal and the other three oil. The coal-burning boiler is habitually used in port, but may be used underway.

Design.—The ship's officers stated that the bridge on this type of boat is poorly located, in that it is too far forward. Several officers had been injured by seas shipped over the bridge. In a moderate sea the personnel are continually drenched by spray. This is a recognized defect and has been corrected in later types.

The ground tackle is well designed. It consists of two 1-ton patent anchors and 1¼-inch chain. During the total period of our operation with destroyers of this type there were at least three instances of our destroyers dragging, when the Japanese destroyers held the bottom under worse conditions.

The guns (four 4.7-inch) are well distributed on the center line and have good arcs of train and ample room for loading in any firing position on either side.

Cooking arrangements are primitive, but probably satisfactory, considering the diet of the Japanese enlisted men.

On an inspection of this ship the Japanese officers appeared to be greatly impressed with the design of our bridge, officers' quarters, and crew's quarters.

Fire control.—The method of fire control is believed to be elementary. A 1-meter base range finder mounted on a carriage was rolled from one wing of the bridge to the other. A small conning tower about 4 feet in diameter installed on the afterpart of the bridge housed about six voice tubes, leading presumably to the guns and torpedo tubes, and several instruments believed to be crude visuals. The tower was not armored, but served merely as a wind and weather break for the talker.

Torpedo control.—The torpedo battery is controlled through the same talker as the gun battery. Sight angles are computed on the bridge and sent by voice tube to the torpedo tubes. No torpedo director is mounted on the bridge. If one is provided, it was stowed below.

The torpedo battery consists of three center-line 45-cm. double-barrel tubes. The arc of train through which torpedoes can be fired is 100°, 40° on the bow to 40° on the quarter.

The conversation of the Japanese officers indicated that the service was divided on the relative merits of triple and double barrel tubes and that the double-barrel tube was being retained on all first-line destroyers. One officer stated that the triple tubes installed on the *Momo* class were unsuccessful.

An opportunity was offered to inspect the *Hamakaze*, a sister ship of the *Tokitsukaze*. The same general remarks apply to her, but it was noted that she was considerably cleaner and more shipshape than the *Tokitsukaze*.

JAPAN

AVIATION

Report of Visit to Naval Air Station Kasumigaura

There are two distinct stations, one for seaplanes and one for land planes. The office buildings and barracks are at the latter.

The seaplane station has seven temporary hangars with framework of wood or iron and canvas covering. The seaplanes used at present are Yokosuka type training planes, with 200-horsepower Hispano-Suiza motor and two peculiar shaped pontoons, somewhat of the same shape of an army tank. About 12 of these planes were seen and about 4 were being flown. Instead of using a continuous concrete beach for the seaplanes, sloping concrete surfaces wide enough for one plane run out into the water at about 50-yard intervals. There are 2 of these "slips" now, and the ultimate plan of con-

struction calls for 10. One large double hangar of metal construction throughout was nearly completed and another will be built soon. Each of these hangars will hold about 20 of the present type of seaplane or 10 of an improved type which is now being tested but is not ready for service. According to a newspaper report, a seaplane exploded in the air and the pilot was killed the day before my visit. No menton of this accident was made.

Lieutenant Smith, of the world flight, said that there was one excellent plane for use from a carrier, but I did not see this plane.

The land field is very large and level. In its center are the five hangars surrounding a central repair shop. The hangars are well built and excellently designed. Two of them and one-half of the flying field are used for training. Two-seater Avro planes with rotary engines are used. There are probably about 30 of these planes and about 5 were actually in the air.

The other half of the field is devoted to advanced training, and the two hangars there are used for observation and fighting planes.

The observation planes are very similar in appearance to our *DH–4* planes used by the Army and use a 300 Hispano motor—to the best of my recollection. They are built by Mitsubishi.

The fighting planes are built by the same company and were highly praised by the Japanese. They use a stationary engine of Japanese make and have a speed of 120 miles. They are said to be excellent for stunting.

Two torpedo planes were seen. One was a triplane single seater which was said to be obsolete. The newest torpedo plane was a biplane with 400-horsepower Napier engine ("Lion," I believe). The torpedo carried must be very small, for its rack on the plane could not have been more than 15 inches in diameter. The plane was much smaller than the world-flight Douglass *D–WC* planes.

One *Amphibian* plane was seen in the air, believed to be of the "Sealion" or "Seagull" type.

I was shown navigational instruments, including a bubble sextant, a cylindrical omnimeter for working lines of position, magnetic compasses, drift indicators, and various forms of protractors. All these instruments are believed to be British.

There was a special room for instructions in bombing. On the walls were diagrams of bomb sights. Various kinds of bombs were seen, but it is estimated that none were over 200 pounds.

There were special buildings for collecting weather data for photographic work and for radio instruction. At the flying field there was an excellent signal tower. A good radio with the antenna strung between two structural masts about 200 feet high is just being put into operation. A large game board about 30 feet square was installed in a large room in the main office building.

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The course of instruction is for one year and the class consists of 20 officers and 40 enlisted students. There are about 10 per cent of failures.

There is a large Zeppelin hangar designed by Germans. The Japanese have no rigid airships, but operated a small nonrigid ship until it was destroyed with the five men in its crew a few months ago.

There is a turntable upon which a plane may be revolved for determining compass deviations.

There were three small temporary hangars near one end of the flying field in one of which the *Amphibian* plane was housed.

In general, the station appeared to be well operated; discipline seemed to be perfect.

This report is submitted not with the idea of reporting any new developments which our Air Service might copy, but to give a concise summary of the present air situation in the Japanese Navy.

FRANCE

NAVAL ACTIVITY IN THE MEDITERRANEAN

There has been a pronounced increase in French naval activity in the Mediterranean region during the past six or eight months. The assumption of power by the Herriot (Socialist) Party at Paris does not appear to have affected this development.

This more vigorous naval spirit has supervened upon the reorganization in 1923 of the French system of maritime protection which resulted in the creation at Marseille of a headquarters for the "Frontiérs Maritime du Sud de la France" with a high-ranking vice admiral in charge, assisted by a rear admiral and a strong staff of aids. Since the replacement of Vice Admiral Amet by Vice Admiral Fatou, in April, 1923, the new access of energy has been particularly marked.

The intensification of activity, however, is not believed to be in any sense the fortuitous result of the better mechanism or administration, or of the personal abilities or ideas of any commanding officers. Rather the improvement in the organization and in the selection of personnel appear to be merely the visible manifestation of a determination on the part of the highest French naval authorities that the sea forces of France in the Mediterranean shall be made stronger and more efficient. The changes in method of control and in the type of officers who operate the system of control are probably simply indicative of a settled naval policy on the part of the French Government to enhance the naval power of the country in this region. The form of administration may be modified and, in fact, is believed al-

ready to have been modified to strengthen the authority of the vice admiral commanding the southern French maritime frontiers; and the officers at Marseille may be replaced, but the new importance attached to French naval development here seems likely to continue and perhaps to be augmented.

At the present time the only possibility for a relaxation of naval effort here would seem to be in the general weakening of the French attitude toward armed preparedness, which might arise from the quasi pacifist theories of the new "liberal" cabinet at Paris, or from international agreements for the limitation of armaments. As yet, however, the signs do not point to any intention on the part of the Herriot Government to curtail in any detail the extensive program of practice tests, maneuvers, and betterments in equipment which was worked out and put in motion by the preceding Government. Mr. J. L. Dumesnil, the new French Minister of Marine, has already visited the region and held many conferences with the leading naval officers. On June 27, 1924, he inspected the naval arsenal and yards at Toulon, as well as the French Mediterranean battle fleet based upon that port.

STRATEGIC NAVAL SIGNIFICANCE OF THE WESTERN MEDITERRANEAN

In view of the extensiveness of the French Atlantic and channel coasts, and in consideration of the preponderant naval strength which Great Britain is for many decades apt to possess in the vicinity of those coasts, it may be deemed wellnigh hopeless for France to undertake a fully successful naval development there. This is not to say that the northern and western maritime frontiers can or will be neglected; but it may well mean that the French naval efforts in the regions named will be limited in character. (In case of an alliance with England the latter could be relied upon to keep open the Dover-Calais line of communication. With England as an enemy the French could hardly hope to maintain large-scale naval warfare against her in the channel or even in the Bay of Biscay.) The maintenance of naval strength sufficient to prevent the blockading of the coasts in question in the event of wars in which England would be a neutral would seem to mark the measure of prudence in French naval expenditures on the sea frontiers in question.

The foregoing hypothesis have been stated merely to furnish a perspective with regard to the Mediterranean naval frontier, as to which a very different set of considerations are believed to govern the French attitude.

It is (*a*) much more *essential* for France to dominate the western Mediterranean than the waters of her northern and western shores, and it is (*b*) much more *feasible* for her to do so.

From the defensive standpoint it is essential in time of war that France maintain free and constant marine connections with her north African possessions and protectorates. The reservoirs of manpower in French Africa constitute one of the nation's strongest assets; and the vast African granaries, fields, flocks, minerals, etc., are hardly less vitally important. It is highly desirable likewise that connections be kept open with Indo-China, Madagascar, and the Pacific. For the African contact the control of the western Mediterranean is crucial, and if established would be completely sufficient. For the ultra Suez contacts such a control is of great consequence and would be exceedingly helpful.

From the offensive standpoint a Mediterranean naval preponderance might sever the Trieste trade channel into the southern Germanic regions, might gravely handicap the commerce either of Japan or of Great Britain, and might (in remote eventuality of a war among the Latin countries) be a decisive factor against Italy and Spain.

The practicability of naval success for France in this region is also greater than elsewhere. The Spanish naval forces are apparently little to be feared; although if Spain were hostile the French tranpsorts could not follow the Iberian coastal waters for immunity from submarine attack, as was done during the late war. Nothing short of a disastrous general naval engagement with the Italian fleet could make Italy fatally dangerous. In the unlikely event of a coalition of both these Latin powers against France the latter would be apt to enjoy the support of, or at least neutrality of, England. On the other hand, in the contingency of a war against England there would be a good prospect of Italian and Spanish aid, as Italy and Spain would be even less disposed to see Britain control the Mediterranean than France. The English line, Gibraltar, Malta (Port Said), could almost certainly be cut. Altogether, the French naval prospects appear superior in the Mediterranean, not only from the technical but also from the political standpoint, than in other quarters. The fuel situation presents perhaps the largest factor of vulnerability; but the neutralization of the Turkish Straits, coupled with the construction of oil pipe lines from Iraq to the Syrian seaboard, offers hope for petroleum supplies.

CURRENT NAVAL ACTIVITY

The frequency of gun practice, trial maneuvers, theoretical attacks, and sham battle during the recent months have been the chief outward and ascertainable evidence of the new policy of energy in the southern French naval forces. The French naval laws, decrees, and appropriations can not properly be studied at Marseille.

On January 25 and 26, 1924, the city and port of Marseille underwent an attack from the sea, conducted by a red fleet. The battleship *Lorraine*, with four torpedo boats, appeared off Cape Couronne and exchanged bombardments with the battery of Nolon (near Cape Majean). On the other side of the Bay of Marseille, due south of the city, the battleships *Bretagne* and *Provence* sought to approach by passing between the Planier Light and Cape Croisette, supported by five torpedo boats. They underwent the fire of the Croisette batteries. Their supporting submarines engaged the two submarine chasers *l'Escaut and l'Amiens*. It is said that the light cruiser *Strassbourg* also participated as a putative airplane carrier.

Putative antisubmarine nets likewise appear to have figured. Searchlights were active during the nights and the sound of heavy firing (blank charges) was frequent. The wireless observation posts at the Bec de l'Aigle, Cape Croisette, and the island of Pomegues were active. The defense by the blue forces was commanded by the commandant of the marine at Marseille and the commandant of the sea front of the Marseille region, holding the ranks respectively of "Captaine de Vaisseau" and "Captaine de Fregate." The defensive operations were directed from the wireless station at the Basilica of Notre Dame de la Garde, a somewhat doubtful proceeding in view of the ease with which the guns of hostile fleets could probably demolish this station at will. The hydroplanes did not come into action, due, it is said, to the night and morning heavy mists.

BATTERY AND BATTERIES PRACTICE AT MARSEILLE

The results of the experiments were not announced, although it was stated that the desired objects had been effected and that no accidents occurred. The popular opinion at Marseille is that this port is invulnerable to sea attack, because of the strong batteries of Nolon and Croisette, already mentioned, and at Escalette, near Croisette. There are additional batteries on the islands of Pomegues and Ratonneau, and at Endoume, Montredon, and Roucas Blanc Prophète. The latter, according to an unconfirmed rumor, is the strongest of all. There are also batteries at the Forts St. Nicholas and St. Jean, and at the Pharo, and in the immediate vicinity of the mouth of the commercial harbor entrance and the vast system of quays and docks, the largest in the Mediterranean.

MISCELLANEOUS ACTIVITIES ON THE SOUTH FRENCH COAST

On June 25 the dispatch boats *Suippe* and *Escaut*, of the fifth patrol squadron, visited Marseille in company with the submarine division. Vice Admiral Fatou embarked on the *Escaut* and personally supervised the maneuvers of these vessels on the 26th and 27th

of June near Marseille. These maneuvers seem to have been correlated with the sham attack a few days earlier at Toulon, when the French Mediterranean Fleet was opposed on the occasion of its return to its base from its North African cruise.

The tour of the Mediterranean Fleet in North Africa, ending June 20, is doubtless fully known to the American Navy authorities. It paused in Corsica on its return voyage, probably at the strong French naval base at Ajaccio, and certainly for target practice against the cliff of Vacca. It was attacked by local submarines on its entry at Toulon.

Vice Admiral Fatou, of Marseille, who commands the entire southern maritime frontiere, made a formal inspection visit at Toulon, July 1 to 5. On July 6 he embarked on the *Escaut* for an inspection of the naval base at Ajacco, Corsica, and of the other naval activities in Corsica.

On July 9 and during the four days following, experiments with smoke screens were carried on in the proximity of the harbor of Toulon.

COMPLETION OF ANTISUBMARINE NET AT MARSEILLE

It will be remembered that the shore line of Marseille and its coastal suburbs describes a curve shaped like a rather flattened fishhook. The bottom of the curve is interrupted in the middle by the promotory of Endoume, and a group of islands lying just off the headlands. In order to reach the entrance to the harbor all ships must pass through the comparatively narrow channel between the islands and Endoume or either through the broader channel between the islands and the long side of the hook, the Hove promontory.

It is obvious that antisubmarine nets can very conveniently be thrown across both channels to the islands from Endoume on the one hand and from Mejean at about the middle of the long side of the fishhook, on the other hand. It is understood that this was attempted, and at least partially carried out during the recent war.

Since the war, accordingly, the naval authorities have been insisting that nets be constructed to reach entirely across the bay, from the tip of the fishhook passing entirely outside of the islands. The line of nets is much longer, but the protection is much greater.

Reliable information is now at hand to show that this plan has been adopted, and that the nets have actually been completed and tried out. It is believed that between June 20 and June 30, 1924, a complete installation of this kind reaching from Mejean on the north to Croisette on the south, and passing well outside the islands of Pomegues and Ratonneau, was placed in position and found to be satisfactory. The nets are supported by floats or buoys. It is be-

lieved that after trial they were dismounted and stored on the island of Promegues; and that they will remain in the fortifications on that island (which is always closed to the public) for an indefinite period, probably permanently, ready for immediate use. Information as to the dimensions, material, and mode of manipulation of these nets is wholly impossible to procure. It is possible that they are designed to protect against surface craft as well as against submarines.

FRANCE

REPORT OF VISIT TO FRENCH NAVAL ACADEMY

L'Ecole Navale is situated on the water level a little northeast of Brest, being well protected by a long breakwater in the Roads. It is surrounded by hills which would make excellent locations for heavy artillery and would be hard to attack from the sea because of the distance to the sea proper, its protected situation, and the general condition of the weather off Brittany.

L'Ecole is formed by a group of brick and stucco buildings arranged in the shape of a rectangle. In addition there are a number of wooden structures placed symmetrically about. The sleeping, eating, administration, and study rooms are in the stucco buildings, with the small wooden ones utilized as gun sheds, seamanship, torpedo, gunnery, and similar instruction rooms. The present buildings are merely temporary, having been finished in 1914 to replace the old training ship *The Borda*. Plans are under way at present to construct a fine set of permanent buildings on the promontory near the present school.

Candidates, who must be of at least naturalized French parents, may enter between 16 and 19 years of ago. They are chosen by a combination of four examinations; furthermore, in order to take these, the candidate must have a certificate corresponding to our best high-school ones. The first examination is a strict physical one; passing this, the candidate takes a written examination in algebra, trigonometry, geometry (analytic and descriptive), mechanics, physics, and languages. This is followed by an oral examination in these subjects with the addition of others, such as biography, history, etc. The final test is one in physical aptitude, which includes running, jumping, weight throwing, rope climbing, etc. Marks are assigned on these, and the ones receiving the greatest aggregate are chosen for admission in accordance with the number desired. There are ordinarily around 70 regular pupils and 30 in the engineers in the school at a time. Upon entering the "élèves" sign up for eight years in the navy.

The new ones enter the last of September and for one year are termed as "élèves." They wear clothes almost exactly similar to the sailors, except for a belt, and rate somewhat similar to our "plebes." At the end of the year they become "aspirantes," remaining as such for a year or more, when they are graduated. As "aspirantes" they wear officers' caps and enjoy certain elevated privileges. Besides having their regular white clothes, which are worn at the school, they have blues similar to the uniforms of the officers. The "élèves" have no stripes on their sleeves; the "aspirantes" wear a broken stripe.

In the regular school engineering is left out of the course, which includes electricity, seamanship, foreign languages, gunnery and ordnance, navigation, and special instruction in aviation at the adjacent field. Especial attention is given to the purely naval subjects.

In the engineering school the pupils study engineering subjects almost entirely, beginning the specialization in this subject at the very first.

The teaching is done by officers and petty officers, by far the greater part of the work being practical, although much time is allowed for study. Most of the naval books are drawn up from a collection of pamphlets, which are easily exchangeable.

There are a number of dispatch boats and submarine chasers stationed at the school. On these they make regular excursions of from one to three days every quarter. At the end of the first year the students go on cruises for a six weeks' trip on the European coast. At the end of the second year they graduate as ensigns of the second class and make a cruise for nine months on the cruiser *Jeanne D'Arc*. On their return they become ensigns of the first class.

Each Sunday they have all day from 8 in the morning to 9 at night to visit Brest. At the end of the first year 30 days, i. e., the month of September, are given, also 10 days each at Christmas and Easter. Upon graduating they receive 2½ months leave before going on their cruise.

All at the school sleep in hammocks. These are arranged in rows in dormitories with lockers underneath. Reveille is at 5.40, and the men must rise immediately, dress, and stow their hammocks. An inspection is made by one of the officers at 6 o'clock. The men wash in large "Lavabos" provided for each dormitory and then proceed to a breakfast of coffee and bread. Gymnastics in the outside court are then indulged in for an hour. These are followed by either infantry or classes. At 10 o'clock rolls of bread are handed out and lunch is served at 11.30. The afternoon is devoted to studies, with two hours of recreation before dinner. Both the luncheons and the dinners proved to be excellent meals both in quality and quantity. Wine is served regularly. The "Eleves," or "Nouveaus," sleep and

eat in separate places, but they are subject to the command of the "Anciens." Taps, or "Branlebas," are at 8.45, with lights out at 9.

Punishment consists of confinement in the "prison," a square empty room with an enlisted guard, and sleeping on a narrow plank in lieu of their hammocks.

There is little space for athletics, beyond the rugby and soccer field there being little or no ground. On the court between the buildings there are located side horses, vaulting bars, jumping spaces, and a space for running. The greatest interest is taken in fencing, rugby, and soccer, with track and boxing coming in for their share.

Both the officers and the students provided me every facility during my stay there, and I have never seen a cleaner, friendlier, or more anxious to please crowd of fellows in any place.

ITALY

MANEUVERS OF ITALIAN FLEET IN THE TYRRHENIAN

The Italian Navy during the immediate postwar and succeeding period was more severely tried even than the army, owing to the neglect and demoralization consequent on the attitude of the Government and the general disintegration then prevalent in the land. By a strange anachronism in a seafaring country like Italy, the navy has been, and still is to-day, but little known; both its achievements and its silent activity are alike unknown to the greater part of the nation. During the four years of the war neither the Government nor the Minister of War himself ever thought fit to recognize or encourage our sailors in their unrelenting effort to protect our coasts.

The necessities of our strenuous defense on sea and the various occurrences were almost ignored by the public and what is graver still by the Government circles.

President Mussolini has altered this state of things. Feeling the necessity for a better knowledge and a more adequate recognition of this vast and complex organism he has endeavored by his frequent visits and various sojourns on board this or that naval unit to prove how alive he is to the all-importance of the navy and merchant service for a country like Italy, flung like a huge jetty across the Mediterranean.

The presence of Admiral Thaon de Revel at the head of the Ministry of Marine has been a powerful incentive to the renewal of activity and the restoring of the "morale" of the crews and staff.

In his weighty office he has been efficiently aided by the youthful energy and enthusiasm of Admiral Ducci as head of the naval staff.

Within a brief lapse of time the navy and the merchant service have been restored to their former place. The Italian flag now flies once more in all the Mediterranean ports as on distant seas and rivers, proving to our countrymen scattered over the globe that Italy has not forgotten her laborious children.

In the Near East the *Libia* and *Calabria*, in the Red Sea the *Magnaghi* has installed the "Crispi" lighthouse; the gunboat *Giovannini* is going up the Danube; the *Caboto* likewise on the bigger rivers of China; the scout cruiser *Mirabello* will cruise in the Baltic and will stop at Petrograd; the cruisers *San Giorgio* and *San Marco* are starting on their yearly cruise with the cadets of the Naval Academy; these youths represent Italy's future on sea, and Prince Humbert of Savoy will go with them to visit the South American ports.

These units are commanded by Moreno, Pini, Cattaneo, and other efficient navy men whose services during the war are not forgotten.

FIRST PERIOD OF THE MANEUVERS

The fleet is in command of Admiral Acton, who, having concluded his winter program at Spezia left that port at the end of April to start a series of exercises and maneuvers preliminary to the more important maneuvers in August.

The fleet due at Porto Santo Stefano on May 24 was—

(*a*) Dreadnoughts: *Andrea Doria*, *Duilio*, *Giulio Cesare*, *Dante Alighieri*, *Conte di Cavour*, the largest units in the fleet.

(*b*) Scout cruisers: *Riboty* and *Falco*, and later *Marsala*, *Bixio*, and *Leone*.

(*c*) Two flotillas commanded by Captain Bucci, the *Garibaldini* and the *Generali*.

The submarines are at Naples, in Sicily, and in the Adriatic, where they are practicing jointly with the seaplanes.

Torpedo boats are doing target practice against moving and stationary units of the fleet, attack of submarines lying in wait, etc.

Thus by persevering patient practice day by day the crews are being diligently trained, and we may hope for still better results in future.

BRAZIL

REVOLUTION IN SAO PAULO

August 3, 1924

Part I

On the morning of July 5 the city of Sao Paulo was surprised to see armed soldiers rushing through the streets. Guards were stationed at all the strategical points of the city, principally in the business section known as the "Triangle." They held the two bridges "Viaducto de Cha" and "Santa Ephigenia," that lead to the Triangle. The city had been absolutely free from rumors that usually precede the outbreak of military or political disturbances in Latin America. It was soon learned by the people that a part of the Federal forces and the military police of Sao Paulo, the "Forca Publica," had revolted. But everyone was attempting to ascertain the cause of their action. Dr. Carlos de Campos, who had recently assumed charge of his office as president of the State, was a popular man, of democratic tendencies. It was felt that the movement was not directed against him. Even the soldiers did not know why they had been called upon to fight. They were merely obeying orders. The revolution was, therefore, supposed to be a result of the dissatisfaction on the part of the army with the present Federal Government, and especially with the President of the Republic, a continuation of the revolution of 1922 in Rio de Janeiro. As both contending parties wore the same kind of uniform, it was impossible to know whether the soldiers were Revolutionists or Loyalists.

As soon as the conflict began all business was suspended. Shops were closed. The banks ceased all transactions. The national telegraph station became the principal point of dispute in the center of the city for two or three days. It was obstinately defended by the city firemen (Bombeiros), who remained loyal. On Monday, July 7, it was reported that the Government troops had gained possession of the Triangle, while the revolutionists were holding the other side of the city beyond the bridges mentioned above. The soldiers had entrenched themselves at all the principal points of this part of the city and became engaged in continuous shooting across the bridges and in the narrow streets.

It was reported that the insurrectionists had secured as their stronghold the headquarters of the State forces of Sao Paulo, Quartel da Luz, where they had amassed a great quantity of munitions of war; that they held the barracks located at Santa Anna, where they also had ample stores of munitions, arms, and other equipment;

but that the loyal forces still dominated the situation, inasmuch as they were in possession of most parts of the city.

While during the day street firing continued in various places of the city, at night, from July 5 to July 8, the disloyal troops continued to attack and bombard the palace of the governor, who, it was stated, was still there directing the movement of defense and in communication with the President of the Republic by private telephone service.

Mail, telegraph, telephone, railroad, and tramway communications were entirely disrupted. The report was current that the insurrection had commenced in Rio de Janeiro and in other parts of Brazil, which, however, was the result of rumors.

It was stated that military and naval forces were approaching Sao Paulo from Santos in support of the loyal forces, and that a great many of the military forces upon their arrival espoused the cause of the rebels. No definite news, however, was ascertained.

On the fourth day street firing continued uninterruptedly, and the insurrectionists were still besieging the palace. It appeared that the loyal forces had the situation thoroughly in hand, since their sentinels were entrenched in practically all of the streets.

However, what really happened was that the rebels had withdrawn their troops from unimportant positions and had concentrated them on the Governor's Palace, on the Palace of Justice, and other Government buildings, and had used them in defending certain strategic points of which they had already gained control. As a result of these maneuvers on the part of the insurrectionists, the governor and his guard were forced to evacuate on the eighth day, leaving the city in the hands of their opponents. Although it was rumored that the governor had fled to Santos, it was afterward learned that he had retired to the outskirts of the city, to a district known as Ypiranga, where he was mustering the loyal troops and communicating with the Federal Government in an effort to secure reinforcements, in order to assume the offensive.

It was impossible to obtain reliable information. All reports indicated that the Government troops were either deserting, or consisted of a slovenly undisciplined lot of men, unwilling to fight. These reports were believed by many, especially the laboring class that looked to the Revolutionists for relief from the high cost of living. Immediately upon the departure of the Government troops from the city, looting of some of the large warehouses began on part of the rabble. It was largely an expression of dislike for large industrialists, who were accused of being responsible for the high prices of foodstuffs.

The revolutionists during their possession of the city captured the sympathy of the populace by retaining the mayor of the city,

Firminiano Pinto, and by controlling through him the food prices. Many articles were sold even at a lower price than before the revolution. Of course, this control was not necessarily based on economic principles, but could be accomplished because of the relatively large quantities of supplies on hand in the large warehouses of the city.

After the withdrawal of the Government forces there was a period during which the city was without policing. However, the revolutionary government instituted preventive measures and established guards in various parts, but to a great extent the city remained unpoliced. The mayor organized a municipal guard composed of civilian volunteers armed with revolvers. These, stationed near their respective residences, have rendered efficient service in diminishing the depredations of looters and other unscrupulous persons.

On July 10 the revolutionary leaders published in the Sao Paulo newspapers a manifest of their actions. The principal points of their proclamation are as follows:

It should be borne in mind that this revolution is not an isolated movement. It is a movement of patriotic nature, of lofty social and political signification, and, consequently, its action has a national character. Having been for many months in the process of instigation, it was intended that it should break out simultaneously in Sao Paulo, Parana, Santa Catharina, Rio Grande do Sul, Minas Geraes, and Matto Grosso.

"Being, as it is, a manifestation of national character, it proposes to change completely the condition of the Government of the Republic and of the States in so far as shall be necessary for the execution of the program of the revolutionists.

As for the Government of the Republic, it should be borne in mind from the outset that the national army can not, and never could, accept the government of Dr. Arthur Bernardes, especially in so far as his person is concerned. Notwithstanding known facts, there are still to be considered some very serious offenses which he directed toward the army.

The revolution brings, as one of its objectives, the substitution of the present Government of the Republic, inasmuch as the revolutionary leaders understand that it is out of proportion to the destinies of the country.

The army is not ambitious and does not desire executive positions. It acts with altruism and abnegation. The army wishes that the country be such as the Empire left it, with the same principles of moral integrity, patriotic conscience, and administrative probity.

Brazil is reduced to satrapies, the real worth of men being entirely unknown. The people are in a situation of absolute impotence, and its will is asphyxiated by the will of those who hold the political and administrative posts. These dominators have prevented the people from manifesting their will by means of the ballot, the legitimate organ by which popular sovereignty is exercised in democracies.

Let this recent act be taken into consideration, the act in which the country was not spared a foreign investigation and in which publicity, at the initiative of the Government, was given to a document of the English mission, wherein grave insinuations upon the integrity of Brazilians were included.

It is deemed fitting that the government of the State of Sao Paulo be in the hands of Paulistas of worth and character, and the leaders of the revolutionary

movement, having this in mind, have invited Conselheiro Antonio Prado to be its chief executive.

We wish to declare that the population of Sao Paulo will obtain from the revolutionists every possible effort for safety and guaranty as well as for the proper application of the principles of justice.

Persons may roam freely through the streets of the city and resume their habitual occupations, which will be interrupted only in case our adversaries attack the positions that we now occupy.

This revolutionary movement is an act of indignation and patriotism. The present Government of the Republic does not have the support of the nation, nor of those upon whom rests its defense. We are disposed to carry this movement forward, and if we are conquered the ideals of our country will succumb.

We beg to inform the people that the mayors of all the cities of the State will continue in the performance of their duties.

Between July 9, the date of the departure of the Government troops, and July 16, the rebels strengthened their positions in the city, placing cannons in many places and using the barracks, "Quartel da Luz," and the Luz Station (British property) as their main points. They took possession of all the railway material of the Sao Paulo Railway Co. (British) and kept the acting manager, Mr. Wellington, as prisoner in the Luz Station to manage their trains. Because of his ability, his firmness, his hazardous position at a point under constant bombardment, Mr. Wellington became one of the heroic figures of the revolution. The revolutionists fortified themselves principally in the industrial section known as "Braz" and the adjoining district of Mooca, among other places around the gas works (British property) and the "Hippodrome," or race course. Their cannons were scattered throughout the city, hidden among the houses, and in the garden of the Luz Station.

The Government troops in the meantime extended their lines from the suburbs of Penha on the east to Ypiranga on the south, with the town of Guayauna as the headquarters of the governor of the State and General Socrates, the commander in chief of the Government forces.

During the night of July 12, the legal forces heavily bombarded the city with grenades, especially in the industrial district known by the name of Braz, where many of the rebel troops were stationed. Considerable damage was done to property located in that section as well as in other parts of the city. Many civilians lost their lives by the explosion of the shrapnel. Poor families were driven from their homes, seeking shelter wherever possible. Religious and other benevolent institutions opened their doors to the refugees, but many were forced to remain in the streets or in the open fields. This situation was aggravated by the fact that many of the refugees were without money and unable to procure food.

In view of the continued bombardment of the city, various attempts were made by the Italian consul and the Commercial Association of Sao Paulo to come to an understanding with the belligerents to induce them to confine the fighting to certain districts. However, neither side would compromise itself, so that the bombardment continued uninterruptedly from day to day in the destruction of lives and property.

However, on July 18, the revolutionary leaders gave to the Sao Paulo press the conditions under which they would depose their arms The following is an exact translation of the article in question:

Immediate delivery of the Government of the Union to a provisional government composed of persons of recognized probity and trusted by the revolutionary leaders; for example, Dr. Wenceslau Braz.

The provisional government will convoke, when it shall deem fit, a "constituent assembly," which will maintain obligatorily—

First. Federative republican form of government.

Second. The present boundaries of the States in so far as regards regional interests, with the possible diminution of the number of units of the Federation, in order to make a more even distribution.

Third. Separation of the church and the state, causing the strengthening of the principle of religious liberty and the defense of the Catholic majority in their constitutional rights against the intolerance of irreligiosity.

Fourth. Attribution of justice to determine the constitutionality of legislative acts.

Fifth. Prohibition of interstate customs duties.

Sixth. All that refers to the declaration of the rights of Brazilians, no modification, unless amplificative, being admitted.

Seventh. Prohibition of the reelection of the President of the Republic and of the governors of the States. Likewise, the prohibition of the reelection of Federal and State deputies and senators, unless they shall obtain two-thirds of the votes of appearing electors.

The provisional government shall enforce as soon as possible—

First. In so far as foreign relations are concerned, the traditional politics of Brazil shall be maintained to settle pacifically international conflicts.

Second. To maintain all the present obligations of the Union, of the States, and of the municipalities.

Third. To decree the secret ballot.

Fourth. To realize the unification of magistracy and legal procedure.

Fifth. To effect tax and customs reforms, preventing the participation of fiscal and customs agents in the profits of fines and apprehensions.

As far as the armed classes are concerned, absolute respect will be demanded of the administration toward the legal rights of military men and of the law-making power toward their constitutional rights.

Sao Paulo, July 17, 1924.

(Signed) General Isidoro Dias Lopes,
Chief of Revolutionary Forces.

On the 16th the southern part of the city was suddenly alarmed by the entrance of the Government troops through Villa Marianna and Acclimacao, that proceeded as far as the "Avenida Paulista," the principal thoroughfare of Sao Paulo. From that time on until

the end heavy and continuous fighting was carried on in Villa Marianna, Acclimacao, Paraiso, Cambucy, and the streets of Vergueiro and Liberdade, endangering the lives of civilians and causing considerable destruction. For a long time the barracks of the Fifth Battalion became the center of terrific fighting and the objective of Government shells. It was captured and recaptured a number of times. But the main objective points of the Government troops continued to be the "Braz" and "Mooca," with the evident intention, by capturing these points, to open the way to the Luz Station through the lower part of the city.

During the latter part of July the revolutionists issued a statement offering volunteers 10 to 15 milreis for one day's fighting, 1 cento of reis at the end of the war, and a tract of land in any State of the Union. This was considered an indication of weakness. It also became generally known that the Government had received large reinforcements of men and supplies of arms and ammunition. On Sunday, July 27, a Government airplane flew over the city dropping papers that warned the inhabitants of the coming bombardment and requested the people to abandon the city to the revolutionists. It appears that on July 25 and 26, contrary to reports, the Government troops had advanced considerably in the Braz district. It is reported that the revolutionists believed their cause to be lost when they saw their men pushed back through Bresser Street in Braz and driven from Vargem do Carmo. They had made secret arrangements to leave by train, appropriating for this purpose the necessary material of the Sao Paulo Railway. With the success of the Government troops on the 25th and 26th they evidently used Sunday to organize their retreat expedition. During the night of July 27 they departed from the Sao Paulo Railway and Sorocabana stations, carrying with them large supplies of arms and ammunition, cannons, cavalry, money from the Federal treasury, and over 2,000 men. Thus, on July 27, the revolution collapsed as unexpectedly as it had started, and the well-organized departure of the troops showed the same able and secret planning as the disposition of the men at the outset.

The President entered the palace on Monday, July 28.

Government troops immediately started in pursuit of the rebels with over 3,000 men. The revolutionists attempted to impede the progress of the pursuers by damaging bridges and tunnels and tearing up the rails. It is reported that the fleeing troops looted and appropriated automobiles in Campinas, Rio Claro, and other points of the interior, causing a great deal of damage. It was probably their intention to proceed to Matto Grosso, where the troops are largely composed of disloyal soldiers. However, according to the latest information, not yet confirmed, but probably correct, Government troops were stationed on the Parana River that took possession

of the ferryboats necessary to carry the troops across the river into Matto Grosso and prepared for the burning of the many small wooden bridges in the northwestern part of Sao Paulo. Seeing this, the revolutionists are reported to have turned back to escape to Paraguay, using the Sorocabana line. But finding armed forces to harass them, they returned and entered the town of Botucatu, where they are now said to be surrounded.

It is believed by some that their original plan was to use the Sorocabana or Southern Railway line to escape if necessary. But upon the outbreak of the revolution, Fernando Prestes, vice president of Sao Paulo, organized civil troops in the southern part of Sao Paulo to protect the State from invasion from the south. He then turned his men to the town of Ipanema and defeated the rebel troops in a series of battles, until he reached Sao Roque. Stationed there, he prevented the retreat of the rebels by the Sorocabana line.

Part II

Military Organizations

The revolution that broke out in Sao Paulo on July 5 was well planned.

The people of the city neither desired nor expected an uprising, and undoubtedly the industrialists realize that the destruction of a part of their town and the loss of life are due to military unrest that has existed in Rio de Janeiro for years. It is generally believed that it was only a part of a contemplated general uprising, including the troops in the capital, the States of Rio Grande do Sul, Santa Catharine, Parana, and perhaps other points. The opinion has been expressed that the revolutionists gained support:

Firstly, from the revolutionists in Rio Grande do Sul that have been agitating in this State and lending their services. At least, Joao Francisco, of Rio Grande do Sul, considered a professional revolutionist, was one of the main leaders. The name of Assis Brazil, of Rio Grande do Sul, has been mentioned in this connection. Gen. Isidoro Dias Lopes, commander in chief of the revolutionary forces, is an ex-army officer, though it appears that he is not the prime mover, or the main guiding spirit.

Secondly, from Alvaro de Carvalho, former Federal senator, and Julio Mesquita, journalist and editor of the Estado de Sao Paulo. These were among the political party opposing the former president, Washington Luiz.

Thirdly, from Altino Arantes, who represents a religions group wishing greater support from the Federal Government.

Fourthly, from the military class in Rio de Janeiro.

Relative to the second point, it may be added that the separation of Alvaro de Carvalho from the Government party this year is significant in connection with the revolution. The opposition to Dr. Washington Luiz appears to be largely responsible for the creation of an anti-Government sentiment in the towns of the interior of the State, for an attack on what is considered to be a high-handed policy of the former administration, an arbitrary disregard for public opinion, a form of oligarchical government, both Federal and State, for which the present president of the State of Sao Paulo had to suffer.

The execution of the plans was intrusted to Maj. Miguel Costa, of the police force, and Capt. Joaquim Tavora, of the Federal army. These worked in conjunction with Zecca Netto, Lieut. Custodio de Oliveira, and others of minor importance. Lieutenant Oliveira was in charge of the artillery from Quitauna and conducted the bombardment of the palace and other Government buildings.

Gen. Abilio de Noronha, commander of the Federal forces in Sao Paulo, was taken prisoner about 5 o'clock a. m. of July 5.

Of the "Forca Publica" the following troops revolted:

The cavalry.

The First Battalion declared for revolution, but part deserted.

The Second Battalion.

The Third Battalion.

The Fourth and Fifth Battalions remained loyal, together with the firemen (bombeiros) and civic guard.

Of the Federal troops the following revolted:

The Fourth Regiment of Infantry from Quitauna.

The Fifth Regiment from Lorena.

The Sixth Regiment from Cacapava.

The Fourth Battalion of "Cacadores" at Santa Anna.

The Fifth Battalion of "Cacadores" of Rio Claro.

One artillery regiment from Itu (nine batteries).

Three batteries of heavy guns from Quitauna.

One group of mountain artillery from Jundiahy.

It is estimated that these forces provided the revolutionists (no unit came in as a whole) with about 5,700 men. Then the ranks were filled with volunteers, sympathizers from Braz, reds, Germans, Hungarians, and other civilians over 2,000, making a total of about 8,000.

It is believed that the Government had about 15,000 men at its disposal, which are said to have been composed chiefly of the police forces of the various States, and not of Federal troops.

MISCELLANEOUS BOMBARDING AND SHOOTING

The falling of shells in many places of the city without apparent reason has caused considerable interest. The revolutionists started

with the use of artillery from the 5th to the 9th to destroy Government buildings. Among these was the residential palace that corresponds to the White House. When the Government concentrated its forces, it responded with heavy artillery, firing into the city. The bombarding of the city must be considered as miscellaneous, not in the sense of wanton destruction of innocent lives and property, but in the sense of inaccuracy. The rebels had placed cannons in many parts of the city. At first, the shooting on part of the Government forces was so inaccurate that it was often impossible to explain the reason for shelling certain streets. But this was due to deteriorated ammmnition and, perhaps, to inexperience. Later, a great improvement was noticeable, so that strategical points were destroyed. It was also recognized that attempts were made to dislodge cannons that had been placed in residential parts of the city by the rebels.

REFUGEES

When the revolution broke out, many of the wealthy class left the city. These had country estates or friends in the rural districts. But the bombardment of July 12 caused such distress and alarm in the Braz district, the vicinity of the Luz Barracks and Luz station and other zones that a general exodus of the poor people commenced. Later, when the Government troops entered the city (July 16) the inhabitants were compelled to flee from Villa Mariana, Acclamacao, Paraiso, Cambuey. For a while 12,000 tickets were sold daily at the Luz station. Many of the refugees returned because of lack of food, accommodations and money.

The departure from the city was most difficult. There was a great lack of gasoline and automobiles. Automobiles were constantly appropriated by the revolutionary soldiers. The train service to interior points was interrupted or irregular. Besides, the Luz station, the point of departure, was continually bombarded. Some of the mayors in the interior sent word to the station not to allow any more refugees proceed to their cities because of lack of food and shelter. It has been estimated that altogether 250,000 people fled from Sao Paulo.

The Italians and Spaniards suffered the greatest losses because of their large numbers and residence in the factory districts.

DESTRUCTION OF PROPERTY

The only American property destroyed was the Atlantic Refining Co. The warehouse of this company containing lubricants was destroyed by fire. It is too early to make a correct estimate of the damage wrought by the bombardment and by fire.

The heaviest losses were sustained by the Anglo Mexican Petroleum Co., The Crespi textile mills, a part of Gamba flour mills, the Fiat Lux Match Co., the Sao Paulo Light & Power Co., and the Sao Panlo Railway Co. The firm of Mattarazzo & Co. suffered greatly from looting. It is believed that 100,000 contos, about $10,000,000, is a conservative estimate of the losses resulting only from bombardment and fires.

In addition to the above, the Criminal Forum was destroyed, where valuable legal documents, referring to pending cases, were kept.

THE POLITICAL ASPECT OF THE REVOLUTION

While the revolution was successfully quelled, many of the people fear that sooner or later revolts in other parts of Brazil may again involve Sao Paulo.

There seems to be in the interior a general undercurrent of dissatisfaction with the present Federal administration. The proletariat expressed its sympathy with the revolution because of the constantly increasing cost of living and relatively low wages. The more enlightened classes, though not so generally in sympathy with the revolutionary movement, do express their approval of parts of the revolutionary platform, proclaimed on July 18, especially of the secret ballot and customs reform. The publication of this program was a clever move. It is evident that the revolutionists did not fight for noble principles, for high ideals, for political reforms. Their object was solely the disposal of President Bernardes. But they veiled their object with a recollection of existing deficiencies in the administration. The chief political feature of this revolution may, therefore, prove to be a sincere attempt on part of the people, at a later date, peacefully or otherwise, to effect those reforms for which the revolutionists pretended to fight.

The revolutionists discredited themselves toward the last by appropriating Government funds and by failing to maintain in general the high standards that appealed to the people at the beginning. But the important fact is that they announced to the nation the latent, though growing, desire of its people.

GERMANY

THE GERMAN NAVY AFTER THE WAR

The following is a translation of a German article which it is believed will be of interest to the service:

"The German Navy after the war?"—Is there still such a thing as a "German Navy"?—Have we got any ships left?—Whatever does Germany want a navy for now?

How often these questions have been asked, and not only inland. To furnish the answer is the main object of the following remarks:

AFTER THE COLLAPSE

When in November, 1918, the demands of the Allies, instigated by hatred and fear, robbed us of practically all our modern ships and insanity at home destroyed what the enemy left us in the way of material and organization, then it is true there was no longer such a thing as a navy. The ships rotted in the dockyards; the crews, tired to death of war, dispersed to all the points of the compass.

A remnant, incapable of forgetting what the duty of the navy to the Fatherland was, a remnant that scorned to forsake its brother citizens in the hour of need, composed mostly of members of our unsurpassable submarine and torpedo-boat units, foregathered in naval brigades. What these men have done to save Germany need not be enlarged upon here.

The naval brigade were shore troops, corps of volunteers raised by energetic leaders, assisted by the Government, intended exclusively for employment on land. At the same time the Government, partly under the pressure of questions of foreign policy, endeavored with the help of its administrative apparatus to raise up a "floating" navy out of the ruins left over.

FIRST BEGINNINGS IN RECONSTRUCTION—THE MINE SWEEPERS AND THEIR WORK

The Allies demanded that the countless mine fields which had been laid down during the war should be removed as soon as possible, and imposed the lion's share in this task, which had to be taken in hand at once, upon the vanquished enemy.

That called for quick action. As conscription had been abolished, the mine-searching units had to be formed by enlistment. That was only accomplished by the expenditure of considerable sums of money, as military service was disliked and the work was dangerous. Part of the war-trained mine sweepers, whose cooperation could not be dispensed with, took a very radical view, and refused to admit that such dangerous work as the removal of fully charged mines, unless carried on under strict rules of discipline, was bound to lead to loss of ships and crews.

Meanwhile the German business world was clamoring, and justly so, for the speedy opening up of the main trade routes in the North Sea and Baltic. The uninterrupted clear passage to overseas ports was a question touching the very life of the nation.

After countless difficulties had been successfully surmounted, it was possible to make a start with the work in the spring of 1919 with a fleet of 300 mine-sweeping vessels.

The field of operations assigned to Germany was the southeastern portion of the North Sea, especially closely strewn with mines, east of 4° longitude and south of 59° latitude, that is practically the former "English mine field"; the whole of the Baltic with the exception of the inner Gulf of Finland, but exclusive of the Cattegat and the approaches to the Baltic; and finally the mine blockade in the Arctic Ocean on the Murman coast.

An international mine-clearing committee formed in London to which Germany delegated a naval officer from the Admiralty, was entrusted with the duty of promoting cooperation between all States taking part in the clearing up of the mines, and of inaugurating an intelligence service and arranging for the exchange of experiences gained in the work.

For the reopening of overseas navigation the North Sea was by far the most important region. For that reason the German department was particularly anxious to get the North Sea cleared as quickly as possible; in the first place the great thing was to prepare wide navigation channels, free from mines, so as to provide clear approaches to the German sea ports.

Progress at first was slower than was expected. Crews were new to the work and the units had to get familiarized with the various mine fields and blockades. In addition, very soon a painful shortage of coal compelled the withdrawal of a great number of mine-searching vessels. The outcome was that up to the end of 1919 all that could be done was to open three channels, each about 10 knots wide, a "West channel" along the Frisian Islands to Terchelling, a "Northwest passage" via Helgoland to the Doggerbank, and a north passage along the Jutland coast to the Skaggerrack, leading right across the mine fields, only the inner portion of the German Gulf being declared absolutely free from mines.

Meanwhile certain units had taken up the work in the Baltic also, and had cleared the western and central portion of mines, including the Great and Lesser Belt and the sound, whereas in the eastern and northern Baltic there were a few narrow clear channels dating from the war where there were no mines and which permitted a passage, albeit a difficult one, through to the northern ports.

At the close of the year, therefore, we had, at any rate, got so far as to provide for the most pressing needs of mercantile shipping. It was much to be regretted that as yet no connected stretches of open sea could be opened up for unrestricted work for the German North

Sea fisheries, and that the danger of drifting mines continued unabated, as, so far, it had only been possible to remove a tiny portion of the mines laid.

Soon after the work of mine sweeping, which was in abeyance during the winter, had been resumed in the spring of 1920 the Kapp Putsch and its regrettable consequences struck a blow at the navy. Everything which in the way of painstaking hard work had been spent upon the reconstruction of the German fleet seemed to have been in vain. The conditions of November, 1918, repeated themselves; officers retiring from service, partly under compulsion, partly of their own free will, left ships and crews without leaders. The utter impossibility of carrying on the work of mine sweeping in a proper manner under such circumstances, and the pressing demands of the shipping interests for more speedy methods in the great work induced the navy department to consider the suggestions put forward by several shipping companies, namely, that the work should be put into the hand of private organizations, assisted by the companies. As, however, even the first few conferences made it clear that it would take months before such an organization would be ready to start the work, and as, on the other hand, affairs began to settle down again to law and order in the navy, the department was spared the necessity of having to retire from the work. The summer of 1920 found our mine sweeper squadrons hard at work again, with the result that by the time the bad weather season set in, nearly the whole North Sea, the Cattegat, and the whole of the Baltic south of the latitude of Libau could be set free for traffic.

MINE-CLEARING COMMISSION

COMPOSED OF SHIPPING COMPANIES AND FISHERMEN

With a view to keeping in touch with the shipping companies, a mine-clearing commission was appointed at the suggestion of the navy department, composed of representatives of the mercantile marine and deep-sea fishermen, which from its very inception has cooperated with the navy department to great advantage in all questions relative to the clearing up of mines.

Whereas during the first two years of this clearing-up work our mine-sweeping crews had nothing but hard work—often as much as 16 hours a day—and in bad North Sea weather, many a time nothing but hard labor in vain and disappointments in plenty, now that the sphere of activities was on the point of being transferred to more distant seas, the more interesting part of their labors commenced in foreign bases, where they had opportunities of making acquaintance with the beauty of foreign countries, and of introducing warships and crews of the new German Navy to them for the first time.

WORK ON THE MURMAN COAST

Whereas part of the mine-sweeping units remained at home to complete the work of clearing the North Sea, the cruiser *Hamburg* with two small mine-sweeping flotillas sailed for the Arctic Ocean in the beginning of July, 1921, to remove the mines laid by us there during the war on the Murman coast and in the White Sea. The base of operations was the small Norwegian port of Vardoe. When entering Kola Bay, where the work was to be started in Russian territorial waters, our ships were fired on at close range by the forts on the coast. As the mine searchers immediately replied with their 10.5 cm. guns, but were somewhat hampered owing to their having already got their trawls, drags, etc., out, an artillery duel lasting some time ensued, during which, however, the Russians were unable to secure a single hit, whereas the small flotilla covered the batteries well, with visible good effect. The work was, of course, abandoned, and the flotilla left the inhospitable coast, steering a course for Vardoe.

Diplomatic negotiations were started immediately, and in due course led to satisfactory results, on the basis of which the mine searchers resumed their work, which they were able to complete without further incidents. Having called at several Norwegian ports on the homeward journey, the unit arrived safe and sound at its home base toward the end of August.

Meanwhile the work in the North Sea and the Baltic had also made rapid strides, so that by the time the winter set in the whole of the North Sea and the greater part of the northern Baltic could be pronounced free from mines.

INTERNATIONAL COOPERATION

What still remained to be cleared were in the main the coastal waters and bays of the former Russian Baltic border States. As these States were also taking part in the clearing up of mines, close cooperation of all navy departments concerned was essential. The German navy department therefore invited the representatives of Latvia, Estland, Finland, and Russia to come to Berlin for mutual conferences on two separate occasions, at which all questions affecting the work, such as mapping out of fields of operation, exchange of intelligence, etc., were discussed and complete agreement arrived at.

By the beginning of October, 1922, all navies engaged in the work had completed their tasks; the Baltic, too, was now free from mines. Only the inner portion of the Gulf of Finland, the clearing of which did not come within the provisions of the Versailles

treaty and was reserved for the Russian naval forces, was still more or less mine infected. A clearance was promised by the Russians for the summer of 1923.

COMPLETION OF THE WORK

The German mine-sweeping squadrons could be dissolved, and their crews were available for further development of the postwar fleet. It is a noteworthy fact that even in the course of the work in the summer of 1922—that is to say, nearly five years after the cessation of German-Russian hostilities—a great number of anchored mines were found in perfect condition; a proof of the excellent quality and durability of our modern mine material.

The mine-clearing work of the navy has been placed in the foreground of this article, and has been discussed apart from the real subject of the actual reconstruction of the fleet, because it forms part of the settlement of the war and is beyond the normal peacetime duties of the navy.

As regards reconstruction of the postwar fleet, this mine-clearing work was in certain respects a hindrance, as a great part of the available personnel was needed to man the mine-searching vessels and the varying nature of the work they were called upon to perform was not always conducive to military discipline. On the other hand we must not forget that the rich store of practical sea experience which leaders and crews were able to acquire in the hard school of the mine-clearing service has been invaluable to the navy of this country.

THE NAVY AND THE DICTATED TREATY OF VERSAILLES

The limits of the German postwar fleet are very restricted and sharply defined by the treaty dictated at Versailles.

Article 185 deprives us of the whole material in ships, etc., left over after completion of the stipulations of the armistice. Article 181 provides that of the old warships then remaining not more than 6 battleships, 6 small cruisers, and 24 destroyers or torpedo boats must be in active service. Article 183 fixes the maximum for personnel at 15,000, inclusive of 1,500 officers and petty officers, which must be provided by enlistment, as conscription is abolished. For the men 12 years' service and for officers and petty officers 25 years' service were prescribed. The object of this was to prevent a recurrence of the "Kremper" system under Scharnhorst after the peace of Tilsit in 1807. Prussia was only allowed an army of 40,000 men, but circumvented the treaty by enlisting recruits, training them for

a few months and discharging them, enlisting new recruits in their place. In this way they managed to get secretly about 40 battalions of trained men more than they ought to have had.)

Officials of the Entente prescribe the armament and ammunition which warships and coastal fortifications are allowed to have. The age limit for warships, on the completion of which renewals may be laid down, is fixed at 20 years for battleships and cruisers and at 15 years for destroyers and torpedo boats. New ships may not exceed 10,000 tons displacement for battleships, 6,000 tons for cruisers, and 800 tons and 200 tons, respectively, for destroyers and torpedo boats. New warship material may only be supplied by factories approved by the Entente, the technical equipment of which is so reduced that they are just able to produce this much war material and nothing more.

THE ENTENTE COMMISSIONS

In the naval ports Entente commissions are stationed to this day, controlling the execution of these provisions. Every commissioning or paying off of a vessel is controlled by them; the ships' lists of the crews are examined; not a single item of war material (which according to their ideas comprises not merely guns, ammunition, fire controlling apparatus, etc., but also, for instance, carpenter's lead pencils on the stores lists of a company) may be taken on board or kept on shore without their express permission.

Continual control by the Entente commissions is of course very irksome; to what pettifogging extremes it is beginning to run is illustrated by the instance of the lead pencils, to which countless similar instances might be added. If anyone believes that we look upon this control as a humiliation, he is mistaken. On the contrary, it fills us with pride, as the measures it resorts to show the respect they have for what the glorious Imperial Navy achieved during the war.

On the basis of Versailles, under the suspicious glances of controlling organizations of our late enemies, the German fleet has been rebuilt. The old warships were, one after the other, taken into the dockyards, brought up to date and transferred to active service. At the time of writing this article (November, 1922) we already have a German fleet once more, albeit of modest dimensions and incomplete in details. "Nevertheless" is its motto.

THE GERMAN POSTWAR FLEET

(*a*) *Ships.*—The composition of the fleet in November, 1922, was as follows (for details of construction, armament, year in which completed, etc., refer to Weyer's Pocket Manual of the Fleet, 1922):

BALTIC FORCES	NORTH SEA FORCES
(Under the Baltic station command)	(Under the North Sea station command)
Battleship *Hannover* (flag).	Battleship *Braunschweig* (flag).
Small cruisers *Medusa*, *Thetis*.	Small cruisers: *Hamburg*, *Arcona*.
Flotilla: *S18*, *G7*, *G8*, *G10*, *G11*, *S23*, *T139*, *141*, *143*, *145*, *149*.	II Flotilla: *T196*, *V1*, *V2*, *V3*, *V5*, *V6*, *T153*.
Tender: *T144*, steamer *Nordsee*.	Tender (also for protection of fisheries): *M133*, *M134*.

Additional, under the command of the training establishment:

(*a*) Small cruiser *Berlin* and sailing tender *Niobe*, for the training of new officers.

(*b*) *T–154*, *M–60*, *M–81*, training of school of torpedoes and mines.

(*c*) Artillery tenders *Drache*, *Hay*, *Delphin*, *Fuchs*, training of school of gunnery.

(*d*) Survey ship *Panther* with four sounding boats.

The following increase may be looked forward to in the near future: Battleships *Elsass* (Baltic), *Hessen* (North Sea); small cruiser *Amazone* (North Sea), and four torpedo boats of the *T–150* series to make up the incomplete North Sea flotilla.

Apart from the battleships *Schlesien* and *Schleswig-Holstein*, which it is not proposed to commission for the present, the fleet will then be complete to the extent permitted by the treaty.

As reserves, for which the Entente commissions granted armament and ammunition, there are provided: Battleships *Lothringen* and *Pruessen;* small cruisers *Niobe* and *Nymphe;* and four each destroyers and torpedo boats.

Half of the battleships, all small cruisers, and all torpedo boats will have attained the age limit prescribed by the Entente in the course of 1923, and are therefore eligible to be replaced. For financial reasons, so far only one single new ship has been laid down, a small cruiser of the latest war-time type. It is not expected that the cruiser will be completed before the end of 1924.

PERSONNEL

The personnel of the fleet is renewed from the ranks of young men, who voluntarily offer themselves for enlistment for 12 years' service in the navy. They are posted, as a rule, after one year's infantry training with the Coast Guard Division or other units of marines on shore. Arrangements have been made for a regular interchange between floating and shore commands.

The career of warrant or petty officers and conditions of promotion of these ratings are practically the same as they used to be.

The career of long-service warrant officers, peculiar to the old navy, has been abolished, as there is no longer any need for them, seeing that long service is obligatory for all; warrant officers taken over from the old navy continue in service until their time expires. New means of promotion had to be devised, in view of the 12-year period of service, for the benefit of those men for whom there was no question or chance of qualifying for noncommissioned officers. This was arranged by creating the ratings of "corporal" and "lance corporal."

REPLACEMENT OF OFFICERS

The training of officers to replace those retiring has been revised in many ways. The fundamental principle is that a young man, joining the navy with the intention of qualifying for officer's rank, shall in his first year of service be trained in common with the rest of the men.

Not until the expiration of this year is he appointed "officer aspirant" and detailed for special training on a training ship under the chief of the training department. Upon completion of the second year of service he is promoted sublieutenant and at the same time detailed for a training course at the naval college, followed by additional training on the same lines as formerly.

Men wishing to qualify for the career of an officer must, as a rule, possess the certificate of proficiency from a college of the higher grade; in cases in which this is not forthcoming the period of training previous to appointments as "officer aspirant" is longer, so as to give the young men a chance of acquiring that general high-grade college knowledge they lack. The experience of the navy so far with the officers appointed according to this new system may be described as satisfactory. Applications are coming in in sufficient numbers so that the men may be carefully selected according to physical and moral fitness. The number of men who have to be rejected as physically unfit is extraordinarily high; this demonstrates in a startling manner how terribly the inhuman, cruel methods of warfare of England have kept back a whole nation in its development.

The men enlisted according to this system form, as a rule, an excellent reserve for the fleet, as they come of their own free will and are imbued with a spirit of love and devotion to the career of a sailor; they are, as a rule, well brought up at home, learn principles of law, order, and cleanliness more readily than was the case with the old-time new recruits. The invariable agreeable impression our naval men make in the streets of our naval garrison towns is an eloquent witness to the truth of this.

THE EMPLOYMENT OF THE FLEET

(*a*) *Its military duties.*—The German fleet of to-day is no longer a "high-seas" fleet.

Should our nation once more be compelled to take to arms, its duty will be the defense of the home shores in combination with the coastal fortifications. A task of peculiar difficulty for the navy is the isolated position of the Province of East Prussia. In a future war the navy will have to endeavor by every possible means to permanently secure the connection, the line of communication with that Province, and in addition it will be the duty of the navy to effectively protect all our other important interests in the Baltic.

The object of the military training of the navy is to prepare it for dealing with these tasks. By careful training of each individual ship and then combining them into squadrons for maneuvers much has been done in these last few years in the way of preparation.

THE PREPONDERANCE OF PEACE DUTIES

It is, however, in the nature of things at present, that military training no longer occupies the all-important position it held before the war. It has already become evident in the short period of its existence, that the peaceful duties to be performed by the fleet are so extensive, that with the small number of ships available, military, i. e., fighting, training must frequently be relegated to the background. Nobody, in the Germany of to-day, will consider that a fault, as what the fleet is able to do for the nation in peace time, is what matters and will matter for a long time to come.

(*b*) *The fleet on foreign service—the necessity of foreign service.*—The foundation of a fleet's efficiency is the proficiency in seamanship and military training of its personnel. To extend its vision, and to render it fit to become the foundation upon which the future depends, its field of work and its range of vision must not be confined to home waters, it must go out onto the ocean and to foreign lands. If this is not done it simply amounts to this: That the money spent on the upkeep of the navy is so much money wasted on unnecessary luxuries, and it will soon be found that a fleet that is moored to a stake at home can not endure: its personnel becomes atrophied as it has no life. A seaman's life means service abroad.

This principle has been recognized as the correct one even by the smallest navies, and has been acted upon accordingly. Starting out from this point the new German Navy Department has from the beginning placed a very high value upon the dispatch of warships upon foreign service. Political and financial reasons have, however, led to these visits to foreign countries being confined to

neighboring European States. The long-planned trip of a small cruiser to Spain and the islands in the Atlantic could unfortunately not be realized as yet.

The first vessels of the fleet to have an opportunity of visiting foreign ports were the mine searchers and the tenders which frequently accompanied them, which were compelled to use foreign bases owing to the, at times, great distance of their field of work from the home base.

In the North Sea, Esbjerg, in Denmark, especially very often extended hospitality to our mine sweepers when they were in need of rest and recreation after a long period of hard work. The Dutch port of Helder also served the same purpose several times.

The Arctic Ocean expedition in the summer of 1921 was particularly valuable in the military and seamanship training of the men, and was heartily welcomed by them as an agreeable change. The beauty of the Norwegian harbors called at in the outward and the homeward trip—Drontjhem, Hammerfest, Tromsoe, Alesund—the visit to the North Cape and the coasts of the Arctic Ocean have left indelible impressions in the memory of all who took part in the expedition. The determination of everybody on board to let the people of Norway, infected by the unscrupulous war propaganda of the Entente, see the men of the German Navy in the best possible light on this their first visit, was the means of promoting discipline in a high degree and increased the self-respect of the crews.

Upon the completion of mine-searching work in the North Sea, the field of operations being transferred to the Baltic, visits to the Swedish ports of Wisby and Nykoeping, likewise Hangoe in Finland followed, succeeded by Libau, Windau, and Riga in Latvia, all of which were used as bases by our flotillas at one time or another.

Meanwhile larger squadrons of our postwar fleet had shown the flag abroad. Sweden naturally was the first country to which our warship crews felt attracted, and where they believed they might expect to receive a friendly welcome.

Sweden, that country of Germanic origin, which treated us with good will not only during the war, the outcome of which was doubtful, but also afterwards, when we had succumbed to superior force, and by countless proofs of active friendship has earned a claim to our gratitude.

Uddevalla, Gotenburg, Wisby, and Gefle were the first ports of call of the German cruisers. The reception of the crews was warm and hearty everywhere. Not only public functions gave evidence of the sympathy extended to the German guests. In private intercourse in family circles also our officers and men were received and made welcome in the most charming manner. The same impressions were

received by the training cruiser *Berlin* on her cruise to Sweden in the summer of 1922—Slite (Gotland, Lulea, Carlscrona).

During her stay in the later port the crews had opportunities of extremely friendly intercourse with their comrades of the Swedish Navy.

THE "HANNOVER" AT STOCKHOLM

An outstanding feature of especial brilliance in the course of these visits of the German warships to Sweden was the visit of the battleship *Hannover* to Stockholm from October 18 to 22, 1922.

Not only the German colony and the Swedish-German Union, but also the town council, the Swedish Army and Navy, the theaters, museums, amusement parks, and public conveyances vied with each other in invitations to brilliant festivities and other kindnesses to the crews. The officers were honored by a reception and dinner by His Majesty the King, who frequently expressed his pleasure at the harmonious course of the visit.

The crews showed their gratitude by exemplary conduct in every respect. During the five days' visit not a single case of intoxication or overstepping of leave occurred, and, as is reported from Stockholm, "the fresh, well-clad, polite, and well-behaved men of the *Hannover* were welcome features in the public thoroughfares of Stockholm."

Fortunately, several opportunities have presented themselves for the German Navy to reciprocate at home the hospitality extended to their comrades in Sweden. On several occasions German naval ports, such as Kiel, Flensburg, and Sassnitz have had Swedish warships as their guests, and it is hoped that they have carried home with them pleasant memories of their visits.

In accordance with old established custom part of our naval forces were again able to make the very useful training cruise to the Norwegian Fjords last summer. The *Braunschweig* and *Arcona* spent some time in the Sognefjord, the *Hamburg* and the II flotilla in the Hardanger Fjord.

The cruise fulfilled its purpose in many respects; from a physical point of view it was refreshing and strengthening for the men, it extended their vision, improved their seamanship, and accustomed them to life afloat.

There still remain to be mentioned the visits, extending over several days, of the *Hannover* and *Medusa*, respectively, to the Finnish ports of Hangoe and Aebo, and of several torpedo boats to Reval in Esthonia, which passed off successfully without any specially noteworthy incidents.

It is obvious that the first appearance of units of the new German fleet was fraught with special meaning. One can therefore under-

stand the suspense with which these visits were looked forward to. What would be the attitude of the native population toward our crews, and what impression would these visits of our warships leave behind them?

That the cordiality of the reception in Sweden not only came up to expectations, but went a great deal beyond anything anticipated has already been mentioned.

In Norway and the former Baltic border states the situation was different; there, with the exception of Finland, perhaps, whom we had actively assisted in the war, germanophil feelings were not to be expected.

For all that, in the vast majority of cases, the same thing was repeated over and over again; at first a frigid attitude of waiting to see how things would shape themselves, not entirely free from mistrust; then, encouraged by the good appearance of ship and crew, general unbending, and finally, evoked by the manly tactful behavior of our men, cordial manifestations of sympathy for the visitors and their German native land.

EFFECTS OF FOREIGN CRUISES

In order to grasp the reason for these stages it is necessary, as rightly emphasized by the reports from the commanding officers, to bear in mind two outstanding facts: During four years of war the British propaganda of lies worked hard in every country; all over the world we have been traduced as "Huns" and "Barbarians." Then came the revolution with all its sordid consequences, creating, with respect to Germany, disastrous confusion in the minds of foreigners—even Sweden was not quite immune—so that we frequently came across the most extraordinary ideas as to conditions prevailing in Germany. And then suddenly with mixed feelings but looked forward to with curiosity, the German warships steam into the harbor, spick and span, evidently well looked after; the men come ashore and behave just as other men-of-warsmen do, perhaps even better, and suddenly all preconceived notions of German ways and German conditions, accumulated in the course of years, are thrown overboard.

Thus a German of position in a Norwegian seaport town writes to the commander of the cruiser *Hamburg:*

> We Germans are grateful to you for the manner in which the visit came off. It has filled us with new faith in Germany's regeneration. With fresh courage we apply ourselves to the work, which we foreign Germans are called upon to do. . . . Everybody is still talking about the magnificent men and is full of praise for their splendid behavior. A citizen of this town, who hitherto was in the opposition camp entirely, talked to me for half an hour about his impressions, and could not find words enough to express his enthusiasm and unlimited sympathy. You see what a success you have achieved, it is of inestimable value.

A Norwegian newspaper writes anent this visit: "A nation with manners and discipline like that can never go under, otherwise no nation would exist."

As a parallel to these sentiments from Norway we may cite a similar experience from Riga, the important commercial center of the State of Latvia, where a visit paid by our mine-sweeping flotillas was exceptionally cordially received and was the cause of many manifestations of sympathy for Germany by the people and in the public press. In one report it is specially stated that the visit of the warships has greatly contributed toward the improvement of German interests, and that leading German business men had emphasized again and again the great benefit and immediate help the visit had been to the German business community in that city.

And from Stockholm we hear, with respect to the visit of the *Hannover*, that it had not only been the immediate cause of an effective ebullition of German-Swedish friendship but, extending beyond that, had greatly contributed toward uplifting public opinion of Germany in foreign countries.

From all this we may conclude that here the German nation at last really has the means of gradually eradicating the consequences of enemy war propaganda in foreign countries and of assisting German nationals resident abroad effectually in their, very often, hard uphill fight.

If there was a need before the war to carry German ways, etc., across the seas on German warships, the need to-day is two and three fold as great in times when that which has been lost must be recovered, in times in which other countries have forgotten to look upon us as we really are, and when men and women of our own flesh and blood are waiting for us to stretch out our hands to them once again after years of isolation.

Here we are truly face to face with a peaceful task of culture for our new German fleet to accomplish. The German Navy was therefore only too glad when it was approached by the foreign office with suggestions and requests on these lines.

We must not forget that Minister Rathenau, lately deceased, was a specially cordial promoter of these aspirations, who, on the occasion of a report made by the author, expressed himself to the effect that the surprising strong effect of the fleet's foreign cruises so far had deeply impressed him, and that he would do everything in his power to make use of the fleet for this purpose.

Don't say, "Certainly, all that is very nice and useful, but financially we can not afford it." Of course, with our exchange at its present low ebb, it is not to be avoided that the dispatch of a warship into foreign waters means the incurring of extra expenditure beyond the expenditure on the same ship in home waters. But this

may be reduced to very modest proportions, as coal and stores can be taken along from home, and fresh supplies can be forwarded.

And one of our late Foreign Ministers, with a clear perception of the true inward connection of things, said when some one or other was complaining about the expense of a foreign cruise contemplated at the time, "The money we spend on it will benefit our trade tenfold."

How closely the interests of our overseas trade are bound up with the navy we shall endeavor to show in the following section of this article.

(*c*) *The fleet and German shipping.*—The relation of the fleet to German shipping as a whole is determined by the fact that the fleet will never deem itself a separate entity dependent on itself alone and existing for its own sake: that it will always consider itself as an integral part of German shipping as a whole in the sense that the fleet considers its most distinguished duty to be to benefit and assist German overseas trade whenever and wheresoever an opportunity presents itself.

NAVAL STATIONS

For administrative purposes this liaison between fleet and mercantile marine is expressed by the establishment of special naval stationes in all important shipping centers, such as Bremen, Hamburg, Lubeck, Stettin, and Koenigsberg, for the express purpose of always keeping closely in touch with shipbuilding and shipping circles, of keeping the latter posted in all naval questions, and of reporting to the chief of the navy's department upon all wishes and suggestions put before the navy by them. It goes without saying that beyond that the chief of the navy department lets no opportunity pass of keeping in personal touch with the leading men in shipping, and of improving the relations between merchant and war fleet to the best advantage of both.

Once upon a time the strong arm of our mighty war fleet stretched far across the seas, and many a time was it privileged to prevent with military means German sea-borne trade from being interfered with. Since Versailles that erstwhile strong arm has withered, and yet, however, humble in proportions our fleet may be to-day, it is quite conceivable—all the more conceivable as our shipping must endeavor to recover that which was lost—that in countries where according to past experience our foreign representatives can not dispense with military protection for our trade interests even in peace time: at some future time a German warship may once again find itself confronted with the task of defending German sea-borne trade, and there is not a single commander of a warship who will not gladly take on the job.

So far the cases in which merchant shipping has needed and received the assistance of the fleet have been confined to the Baltic and the North Seas.

First and foremost we once more refer to the work of clearing up the mines, already discussed earlier in this article. It is true this work was imposed upon us by the treaty dictated at Versailles, but yet it was carried out, not so much on account of such pressure but in honorable appreciation of the fact that in so doing we were doing a most valuable service to German marchant shipping, without which it would have been an utter impossibility for the latter to reopen in safety communication and relations with business connections overseas.

RELIEF ACTION AGAINST DRIFT ICE IN THE WINTER OF 1922

The work of mine sweeping had not yet been completed when a pressing call for help in distress went out to the navy. The relief action of the fleet in the winter months of 1922 was the outcome. Gradually all ships of the fleet ready for sea had to be pressed into this relief service, although the limited number and power of the ships available made it a matter of impossibility to comply with all the just demands of merchant shipping in distress.

The exceptionally heavy break up of ice, which set in with surprising speed, had surprised and caught many German and foreign ships at sea. Such as were far out in clear water found the harbors blocked; those locked up in coastal waters were in danger of being crushed to pieces by the ice, and shortage of coal and provisions began to make themselves felt.

Two German and two Danish steamers were in a specially dangerous position in the middle of January, being icebound in Riga Bay. The navy department immediately dispatched the cruiser *Medusa* to the rescue. The first attempt to get through to the steamers was abortive; at the second attempt the cruiser only succeeded in setting free the Danish steamers, which were nearest to the open clear water. When all further attempts of the cruiser, for some time supported by a Danish ice breaker, failed on account of the thickness of the ice and the unfavorable shifting and packing of the floes—at one time the cruiser got as close as 30 m. to the steamer *Wilhelm Russ*, but then the shifting of the wind and the pressure of the ice compelled a retreat—all that could be done was to supply the steamers with provisions for the next few weeks by means of sledge expeditions, which were often many days on the road, and were only able to reach the steamers and to return under great hardships.

The *Medusa*, herself damaged, was obliged to return to Stettin for repairs on February 10, but on her return trip had the satisfaction of being instrumental in releasing four other German steamers

and one Norwegian from the ice, and of escorting them into clear water.

Meanwhile the drift ice question had been becoming more and more involved in home waters also; as early as the beginning of February the *Hamburg* had been obliged to lend a helping hand in the middle Baltic, and in the middle of the month, besides the *Hamburg*, the *Arcona*, and the tender *Hay* had to be requisitioned for the work. *Hamburg* succeeded in breaking up the ice and in clearing the "Kaiser Wilhelm Canal," and in making the masses of ice in the lower Elbe move. *Arcona* and *Hay* were detailed for rescue work in the western Baltic, where they were able to break up the ice in the Kieler and Flensburger Inlets, thereby releasing many icebound steamers, including one Belgian.

Directly afterwards the *Arcona* had to be hurried off to the Cattegat in response to a signal of distress from the German steamer *Tamara*, where she found the latter drifting helplessly in the ice and in danger of stranding, and was able to get two Danish and one Swedish steamer out of the ice and into open waters.

Meanwhile nothing further could be done for the steamers icebound in Riga Bay. As bad luck would have it, the battleship *Hannover*, which on account of heavy build and engine power would have been specially suitable for the work—at that time in fact the only battleship in active service—was laid up in dock for her annual overhauling since the middle of January, and could not possibly be got ready before the middle of March, no matter how much the work was pushed on. At the urgent request of the owners interested, the navy department then decided, not without serious misgivings, to dispatch another cruiser expedition to Riga Bay, and detailed the *Arcona* for the purpose, the sole available cruiser, as now the *Hamburg* also had been obliged to go into dock on account of ice damage.

Success was unfortunately denied to this undertaking. Although the *Arcona* managed to force her way through heavy pack ice to a point northeast of Domesnaes, she was damaged to such an extent that a hasty retreat was necessary. Nor was it possible to send fresh provisions, as none of the steamers were sighted by the *Arcona* and no information as to their whereabouts was obtainable. Not until the *Arcona* had started on her homeward voyage was it possible for Latvian aviators, who were ready to assist from the very beginning, but were prevented by adverse weather conditions, to locate all the steamers, so that at any rate bare necessities in the way of provisions could be sent to them.

At last, on March 23, the *Hannover* was ready to leave Kiel. Even this heavy battleship at first tried in vain to break through the thick ice floes and to hold her own against the terrific pressure.

Finally April 1 brought the long-desired release to the crews of the steamers, after 10 weeks' imprisonment and hardships of all kinds.

It is said that there were some affecting scenes up there among the ice floes, when in the hour of release man-of-war's man and merchant seamen shook hands. Hansa the prominent nautical periodical wrote at the time: "The great rescue work from the Fehmarn Belt to Riga Bay, which for weeks was devoted to the mercantile marine, is distinguished by actions on the part of those by whom it was conceived, the like of which, in self-sacrificing heroism and forethought, would be difficult to find in the maritime annals of our people. The owners and above all the men of the mercantile marine dare not and never will forget that the men of the navy of the Reich in February, 1922, in the hour of sorest need and at the risk of their own lives gladly stepped into the breach for them."

The new German fleet, however, had the satisfaction of being able to help the mercantile marine when it was needed. The navy trusts that the hardships faced together in that winter have forged a new strong link connecting navy and mercantile marine.

The enthusiastic reception and hospitality accorded to the *Medusa* and a few months later to the cruiser *Thetis* in Stettin on their return from the ice fields, and the cordial reception which the ships of the navy have had in all home ports where they have called so far, may surely be regarded as an earnest of a sincere feeling of fellowship and conviction, that one can not exist without the other, existing in all sections of the community interested in shipping. May it ever be so, and may this sentiment in due course be reechoed farther inland.

PROTECTION OF FISHERIES

Equally close to that with the mercantile marine, is the connection of the fleet with German fisheries interests. In all seafaring countries the protection of the home fisheries against aggression from foreign fishing vessels is entrusted to the navy. The German fisherman having for several years been banished as a competitor on the high seas, his reappearance was not exactly greeted with any particular degree of enthusiasm. As he has no strong German fleet behind him, he finds it difficult to hold his own. Consequently complaints are numerous from German fishermen of infraction of their rights by foreigners, and loud are their demands for adequate protection for their vessels by the fleet.

The fleet has done what it could to comply with these requests. Extensive cruises were made in the North Sea and North Atlantic by M and T boats, and partly by cruisers. In addition to rendering medical and technical assistance the ships were on several occasions able to protect German rights. In many cases, however, military

protection was not on the spot just when it was needed, or arrived too late to help, as with the small number of ships at its disposal the fleet was unable to occupy the most important stations continuously.

The impending increase in the forces by the ships still to be put in commission, which will include a ship specially designed for the protection of fisheries, justifies the hope that from next summer onward the fleet will be in a position to look after the interests of German deep-sea fishermen more effectively than was hitherto possible.

SURVEYING

Immediately upon the conclusion of peace the fleet resumed the work of surveying, which had been interrupted by the war. It is true that navigation channels of military importance were kept under control during the war also, but the necessary regular survey service, especially in the North Sea river estuaries which are continually silting up (a most important service), had been in abeyance for years.

The only ships available for the survey service in the beginning was the old survey vessel the *Hyaeme*, the former merchant steamer *Triton* (neither of them particularly suitable for the purpose), and a few sounding boats; at the end of 1919 the *Hyaeme* had to be withdrawn from the service, being too old for use. Not until the spring of 1921 was it possible to attach to the fleet a proper well appointed surveying ship, by putting into commission the former gunboat *Panther* which had been reconstructed as a surveying ship; the *Triton*, which could only be used to a limited extent in any case, was then withdrawn from the service.

SURVEYING RESULTS

The most important surveying carried out since the conclusion of peace, apart from the estuaries on the North Sea coast, was that in Heligoland Bay with adjacent groups of islands, the western Baltic, and the coastal waters of East Prussia and Pomerania, including the Great and Lesser Stettin Haff: by the end of 1921 a total of about 2,000 square nautical miles of sea had been charted anew. The figures for 1922 were not yet available at the time of writing.

Since the war the surveying ships of the fleet have also successfully done their share of nautical-scientific work. Under the direction of the Institute of Oceanography at Berlin and the German Nautical Meteorological Station at Hamburg careful observations were taken of the tides with a view to completing the somewhat imperfect information in the Nautical Manual.

The most instructive data obtained are now being studied and worked out in the Institute of Oceanography. It will probably pro-

vide a reliable foundation upon which to build up our knowledge of currents and their direction and for the revision of charts in respect to time and rise of tides.

A scientific exploring expedition to foreign waters, extending over some years and for which the *Meteor*, originally intended for a gunboat, is being fitted out, is in course of preparation. It is to be hoped that in addition to funds advanced by the State there will also be contributions from private sources for this purely scientific voyage to foreign climes.

RETROSPECTS AND PROSPECTS

When this article was planned and begun, the object in view of the author was, by discussing theoretical and practical points, to enlighten the reader on the subject of what the German nation might reasonably expect in the near future from its fleet as it now stands. When, however, an attempt was made to find a basis for our considerations among the experiences of the fleet to date, it was found that nolens volens these experiences forced themselves into a prominent position in the foreground of the discussion quite of their own accord. In the short period of time since the regeneration of the fleet these experiences have been so extensive and so varied, that one could not do better than let them speak to the reader in their own way. It was found to be unnecessary to search for theoretical grounds to justify the existence of the fleet; one had only to look back on the practical work performed during the last few years, and there the grounds for the existence of the fleet lay before us in plenty as clear as daylight. Whether they are sufficient in quality and number to justify the existence of the fleet, must be left to the reader to determine.

The future is hidden in darkness, as for our fatherland in general so also for its fleet. Whether it will be possible to overcome the mountains of difficulties piling up, and to complete the reconstruction of the fleet, upon which so many hopes are centered, nobody can foresee.

Financial cares weigh heavily upon the fleet; necessity, distress often compels the best of men to quit the service; valuable technical improvements, necessary provident measures for the welfare of the personnel have to be suspended for reasons of economy.

Continual shortage of fuel compels the fleet to reduce training at sea to a bare minimum.

The few ships at the disposal of the navy are antiquated; one, and one only, replacement is on the stocks. What is going to happen when one of these days, in spite of all care and looking after, the ships drop out of the service on account of sheer old age and senile decay?

But "nevertheless," the German Navy is fully confident that the German nation will not allow its fleet to be crippled, because the nation as a whole will recognize, sooner or later, that it needs its fleet to live. And if all pull together to secure the upkeep of the fleet, then it will flourish again as it flourished before, in spite of all obstacles, to the welfare of the fatherland, to uphold the honor of the German name.

When the battleship *Hannover* anchored in the river at Stockholm, the Swedish newspaper Allehanda called her "A manifestation of the undiminished German will to live."

That expression ought to give the German people food for thought.

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Marine Officer			

The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

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GREAT BRITAIN

16″ TURRETS OF H. M. S. RODNEY AND NELSON

September, 1924

The following information concerning the 16-inch 3-gun turrets of the *Nelson* and *Rodney* has been obtained from a reliable source and the information is believed to be accurate:

The 3-gun turrets are to be unusually large and roomy, the turrets' barbette diameter not having been restricted in the Vickers design, which was based on the results of the 15-inch triple gun mount on the *Lord Clive* and the knowledge acquired by Vickers in the design of 3-gun turrets for the Italian Navy. Each turret will contain three 16-inch 50-caliber wire-wound guns fitted with a modified form of Smith-Asbury breech mechanism operated by two hydraulic cylinders, one to swing the breech block and carrier, the other to rotate the block when opening. Each turret will contain two right-hand guns and one left-hand gun fitted with side-swinging breech mechanisms. The turrets will not be fitted for variable angle loading but will have a fixed loading position at about 3½° elevation.

GREAT BRITAIN

TORPEDO-CONTROL SYSTEM AND COMMUNICATIONS, H. M. S. HOOD

September, 1924

The following is a description of the torpedo-control system of H. M. S. *Hood* according to the best information obtainable. It is given in detail as illustrating the complete system as carefully worked out at the British Torpedo School and the provision of three 15-foot range finders and a separate transmitting station for torpedo control alone as in marked contrast with the rather sketchy system provided for United States naval vessels. However, it should be borne in mind that this is probably due to the very heavy torpedo armametn carried by the *Hood*, although it is understood that in so far as funds permit attempts are being made to follow out this system for all battleships and battle cruisers. It is understood, however, that the installation of torpedo-control systems on battleships was curtailed shortly after

the war and that there are no battleships possessing a system anywhere near as complete as that installed on the *Hood*. The effectiveness of the torpedo control of this system is not known, but it is not believed that the results have been commensurate with the cost of the system as judged by the following quotation from an Admiralty report:

"Estimation to remain the primary method of obtaining the enemy's course and speed and deflection, checked by the information obtained from the torpedo T. S. and from the gunnery T. S. as well."

The salient features of H. M. S. *Hood* torpedo-control system are:

(*a*) The torpedo-control officer is in close touch with the captain, the main-control position being in the conning tower immediately below the captain's platform, with suitable slits to provide the necessary view for the various instruments. Periscopes are fitted for operating the bearing plot in the transmitting station, and others to provide an alternative method of sighting, also to work Evershed bearing indicators for pointing out the target to the range finders.

(*b*) A secondary position aft is provided from which the torpedo armament may be directed in the event of damage to the primary position or the view from it being obscured by smoke, etc. This is fitted with a 15-foot range finder in an armored hood on a power-worked mounting.

(*c*) A torpedo-transmitting station, in close touch with the gunnery-transmitting station fitted with a Dreyer fire-control table adapted for torpedo control and the necessary instruments for transmitting the information obtained, to both control positions, about 19 feet by 10 feet.

(*d*) The control positions located so as to have a view extending as far aft as possible and both with ample room for the required instruments.

(*e*) A torpedo range-finder position between the funnels containing two 15-foot range finders hand trained, one on either side, each having a view from 15° on bow to 180° astern.

(*f*) Connections are also made for firing and controlling torpedoes from fore bridge.

(*g*) The following communications are provided:

Instrument	Position of—		Use
	Transmitter	Receiver	
Course and speed deflection range.	Torpedo T. S.	Both T. C. towers.	Passing information obtained from torpedo plotting table.
Course and speed range change.	Gunnery T. S.	do	Passing information obtained from gunnery plotting table.
Range and deflection orders.	Forward T. C. tower.	After T. C. tower.	Passing orders. Final director setting and range to open fire, to secondary T. C. officer.
Orders gyro angle	Both T. C. towers.	Tubes	

Voice tubes and phones as required.

Bearing of torpedo target transmitter with telescope placed in the forward tower for pointing out the target to the secondary position should the plot be carried out on a different ship to that which is being fired at. Receivers off this circuit are provided in the torpedo lookout position for the use of the observer aloft.

Arrangements are made for firing all tubes from one of three positions, viz, torpedo-control tower forward, torpedo-control tower aft, and the fore bridge, these circuits being wired through 3-way change over switches in the torpedo T. S.

The order and gyro angle circuits between control positions and the tubes are of old type except that for the A. W. tubes. Single transmitters with dual reply receiver elements are fitted in the control towers.

The bearing circuits each side from the T. C. T. forward to the T. C. T. aft are provided to enable the control officer forward to point out the target to the after position, should he be plotting a different ship to that he intends to take as the target. Receivers are also wired off this circuit to the torpedo lookout position for the use of the aloft observer.

The torpedo inclination circuit from the aloft lookout position to the two control towers and the torpedo T. S., for passing to the T. C. officer the inclination of the target as estimated by an observer aloft.

The torpedo Dreyer table circuits and instruments connected with it are shown in the sketches. [Not given here.] The equipment consists of the following:

In each torpedo-control tower—

Two bearing plot transmitters, one each side, working through a change-over switch, fitted with binoculars for observing.

Two bearing valve indicators, one each side, which register the bearing on which the transmitter in the other tower is laid.

A repeat instrument from the torpedo Dreyer table giving enemy's course, speed, deflection, and bearing.

A repeat instrument from the gunnery Dreyer table giving course, speed rate, and bearing of the gunnery target.

A range receiver from the torpedo table (clock range).

A range receiver from the gunnery table.

The transmission of the ranges obtained by the three torpedo range finders is effected automatically, ordinary receivers being fitted in the T. S. alongside the range plot. All three range finders are fitted with Barr & Stroud hand-following mechanism for transmitting ranges to range receivers in the T. S. (human link).

The Evershed bearing circuits.—The equipment consists of—

In the forward T. C. T. a transmitter receiver, each side, driven by shafting off the bearing plot transmitter and working through a change-over switch.

In the aloft lookout position a transmitter receiver in a central position fitted with binoculars for the use of the aloft observer.

In the after T. C. T. one transmitter receiver driven off the training rack of the range-finder mounting.

At each midship range-finder position a receiver driven by a central spigot on the mounting.

In the torpedo T. S. a 5-element selector switch. This is so arranged that either of the three positions—forward T. C. T., after T. C. T., or aloft lookout can be switched on to control and transmit the bearings.

An open-faced indicator is fitted at each position and at the transmitting positions a control key in addition. This latter enables the controlling operator to switch off the circuit, thus working "off" shutters in the open-faced indicators, should he desire for any reason to train his observing instrument off the target.

Navy phones circuit.—Sketch shows telephone connections for use with torpedo control (not shown here).

GREAT BRITAIN

VICKERS ANTIAIRCRAFT FIRE-CONTROL GEAR

September, 1924

The apparatus automatically and continuously gives the angles of deflection to be applied to the guns, so that the distance traveled by the target during the time of flight of the projectile is accurately allowed for in both vertical and lateral planes. The correct fuse numbers to which the projectile should be set is also indicated.

One instrument serves 1 battery of guns.

The predicting mechanism owes its accuracy to the fact that it operates in strict accordance with mathematical formulae that express the true relations between the angular rates at the moment of observation and the future position of the target. It should be noted that any predicting mechanism which fails to conform to strictly correct formulae also fails to give correct readings. The interpretation of the formulae is effected wholly by mechanical means, thus avoiding the disadvantages inseparable from electrical apparati, which are necessarily of delicate construction, and are easily influenced by climatic condition. Further, the fact of hav-

ing to make electrical connections is in itself a potential source of delay and error, and in the event of any part of the instrument not functioning properly the reason thereof is more easily detected in a mechanical instrument than in an electrical one.

The basic formulae are:

$$\text{Sin } d = R_E \times T \times \frac{\sin(\alpha \pm d)}{\sin \alpha} - D^2/2 \sin \alpha \cos \alpha.$$

$$\text{Sin } D = R_T \times T \times \frac{\sin(\alpha \pm d)}{\sin \alpha} \times \frac{\cos \alpha}{\cos(\alpha \pm d)}$$

where d=deflection in the vertical plane.

R_E=angular rate of elevating.

α=present angle of sight.

D=lateral, or horizontal deflection.

R_T=angular rate of training.

T=time of flight of projectile.

The "Vickers" instrument is self-contained, with the various parts of sufficiently robust construction to stand the comparative rigorous condition of field warfare without unduly affecting its portability. The instrument may be erected and set in the minimum space of time, as no mechanical connection has to be made with any auxiliary gear or instrument.

The equipment includes an adjustable tripod on which the predicting instrument is mounted.

Height is obtained by means of a separate height finder.

Two telescopes are provided, mounted on a common shaft. One is used by the elevating number and the other by the training number.

For initial sighting an open sight is provided to enable the operators to pick up a possible target, and means are provided to enable the telescopes to be trained and elevated quickly in such a case. Once the target has been approximately sighted the elevating and training numbers look through their respective telescopes, and whilst the elevating number is bringing the horizontal cross hair of his telescope to cut the target the training number is doing likewise with the vertical cross hair of the training telescope.

The angular rates at which the telescopes are elevated and trained in order to maintain the target on the cross hairs are automatically modified by correcting factors and indicated on separate dials on the instrument. The predicting mechanism of the instrument should be set so that the "rate" indications equal the actual corrected "rates" of the telescopes. This is effected by setting two milled heads so that two superimposed pointers (connected through an accurate rate-measuring device to the linkage) move round the

dials at the same speed as the pointers connected to the telescopes. The various correcting factors have the effect of assisting the superimposed pointers to follow the "rate" pointers, which fact facilitates the duties of the operator. The subsequent amount of adjustment required to be made through the milled heads is directly dependent on the change in vertical and horizontal deflections as the target pursues its course.

Whilst the rate operator has been setting the two milled heads, a "height-and-fuse" operator has been occupied in obtaining the correct "future time of flight" of the projectile and the fuse number to which the latter should be set. This is effected in the following manner:

The telescope shaft is connected by suitable gearing to a light drum carrying a "height-and-fuse" chart, so that the former rotates an amount proportional to the "angle of sight." The drum shaft is also connected, through epicyclic gearing, etc., to the vertical deflection setting head, thereby receiving an additional or decreased amount of rotation proportional to the vertical deflection.

Two sets of curves are drawn on the chart, "Height" and "Fuse," respectively. The former curves are obtained with angle of sight $\pm$ vertical deflection and "height" as known data. The fuse curves are based upon angle of sight $\pm$ vertical deflection and "time."

The operator having previously been given "height" sets a pointer to this particular "height" curve, and as the angles of sight or vertical deflection alter, he maintains the pointer on the curve. The travel of the pointer along a screw is a measure of the time of flight and the pointer automatically indicates the fuse number of the projectile on the chart.

The rotation of the screw carrying the pointer is also proportional to the "time of flight" and is used as a factor in the multiplying linkages.

The values of the remaining three variables—angle of sight, vertical deflection, and horizontal deflection—are automatically transmitted to the several multiplying linkages, which in turn are connected to the "rate" pointers, through the rate-measuring device, which is of the well-known spring-driven disk type.

The resultant deflections are indicated on separate dials, and the lateral deflection may be automatically given either in the horizontal plane or the plane of sight according to the type of sight fitted to the guns and the method of applying deflections thereto.

Wind, spotting, and ballistic corrections may also be embodied in the predicting mechanism, and allowance may be made for the "lost time" between the setting of the shell fuse and the departure of the shell from the gun.

From the foregoing it will be noted that:

(1) The complete apparatus may be erected, leveled, and readings obtained therefrom in a minimum of time.

(2) The total number of operators is limited to four, their various duties being—

(*a*) *Elevating number* maintains target on horizontal cross line of telescope.

(*b*) *Training number* maintains target on vertical cross hair of telescope.

(*c*) *Rate-following number* maintains corrected vertical and horizontal rates by operating deflection-control heads and calls out vertical and lateral deflection.

(*d*) *Height and fuse number* sets a pointer on the "height" curve of a rotating chart and maintains the pointer on that particular curve and calls out fuse number. He may read (from the chart) the fuse number of the projectile.

The instrument described is for portable use with movable antiaircraft artillery, and instructions are given to the gun crew by voice, as in these cases it is not generally considered advisable to have electrical connections between the various positions.

In permanent positions, however, the instrument has added to it tangent elevation gear and transmitting switches, by means of which the correct elevation, training, fuse setting, etc., is indicated on follow-the-pointer receiver instruments at the guns. The gun crews have merely to follow these indications to keep the guns correctly laid for the target.

JAPAN

MISCELLANEOUS NAVAL NOTES

August–September, 1924

[Translated from the Japanese press]

It has been decided by the Government to save ¥4,312,611 out of the 1924–25 budget. The items and figures are as follows:

Ordinary account:	
Office expenses, navy department proper	¥7,524
Office expenses and repairs	33,466
Miscellaneous pay and miscellaneous expenditures	102,431
Maneuvers	11,466
Upkeep of naval ports	12,516
Operations of ships	325,892
Hydrographic expenses	9,130
Miscellaneous educational expenses	13,045
Allowance to employees' guilds	253,734
Total ordinary account	769,204

Extraordinary account:	
Under "Land and water equipment"—Equipment of naval shops	¥600,000
Under "Alteration and repair of ships"—Alteration of ships	300,000
Under "Special account"—	
Naval yard funds	500,000
Working funds for fuel depot	150,000
Pension administration	358
Under "Armament limitation"—Scrapping of capital ships (*Tosa* and *Kurama* to be sold to private company instead of being scrapped by the company)	400,000
Restoration of earthquake damages	1,593,049
Total extraordinary account	3,543,407
Grand total to be saved	4,312,611

NAVY BUDGET FOR 1925–26 SHOWS INCREASE OF ¥24,000,000

The navy department handed its budget for 1925–26 to the finance department. It calls for an expenditure of ¥260,500,000, which is an increase of ¥24,000,000 over the revised present year's budget.

Advance indications had been that the navy budget would be decreased in line with the administration's financial readjustment looking toward economy in all departments.

The budget calls for ¥136,000,000 for ordinary expenditures and ¥124,000,000 for extraordinary expenditures.

The naval authorities decided not to commence building auxiliary warships next year but to postpone it to the fiscal year of 1926–27. Discussion was held as to the postponement of the auxiliary warship construction program among naval authorities, and all but Admiral Takarabe, Minister of the Navy, were against the postponement, it is reported.

Urgent necessity has been dwelt upon by high naval authorities for the speedy completion of the auxiliary warships in consideration of defects in national defense, since the ratio of Japanese auxiliary warships to America is only 45 per cent, while the ratio of principal warships is 60 per cent. However, their project failed to be accepted by the Minister of the Navy, and finally the program was postponed for another year.

Ordinary account:	Increase	Decrease
Maintenance of new ships	¥7,000,000	----------
Additional expense due to increase of aviation corps	3,000,000	----------

Extraordinary account:	Increase	Decrease
Restoration of earthquake damages	¥9,500,000	
Alteration of ships carried over from last year	500,000	
Equipment of new arms	10,000,000	
Technical laboratory, deck planes, naval sanatorium	5,500,000	
Land and water equipments		¥7,000,000
Grand maneuvers		4,500,000
Total	35,500,000	11,500,000
Net increase	24,000,000	

The items under discussion by the Government's administrative readjustment committee comprise matters related to the decrease in number of divisions, a shortening of the term of service with the colors, and other things, as reported before, tending to the readjustment and reduction of the army and navy. Further, the Cabinet is said to have the intention of reducing the fixed number of full generals and full admirals to one-half and to be now drafting a plan to that purpose. Though the official organization prescribes no fixed number of generals and admirals, the Budget provisions admit of keeping 12 generals and 8 admirals (including marshals). Judged by foreign examples, the number is too large, which numerousness goes so far as to depreciate the value of our generals and admirals in no small degree. Taking advantage of the present administrative readjustment, it is proposed to decrease their Budget fixed number.

NOTE.—It seems not unlikely that the number of generals and admirals will be reduced, although not to the extent mentioned in the foregoing translation. The records in this office show that, including the three lieutenant generals promoted to the rank of general on August 20, 1924, there are 17 generals, including 4 marshals, and 11 admirals, including 2 marshals.

GRAND NAVAL MANEUVER

Tokyo, July 25.—More details are made public semiofficially through vernacular news agencies concerning the Grand Imperial Naval Maneuvers for the current year.

The maneuvers in question will be held from October 2 until toward the end of the month (29th). The seat of the maneuvers extends from the southeast of Tokyo Bay to the eastern Sea of Formosa with south of Kyushu and Bungo Channel as the center of operations.

In this exercise will participate all the standing and reserve naval fleets. Admiral Suzuki, commander of the first squadron,

to be appointed as commander of the attacking fleet, and Admiral Takoshita, commander of the second squadron, as commander of the defending fleet (the latter's position might be assured by Vice Admiral Saito, vice chief of the naval general staff), while Admiral Yamashita, chief of the naval general staff, will be appointed chief umpire.

The proposed grand naval maneuvers will have in view, according to the authorities concerned, the application of the plan of campaign studied during the past two years by the navy to practical operations in the hope of finding what is the maximum efficiency of the naval forces of the Empire after the restriction as agreed upon at the Washington Conference. The result of the exercise will be made a subject of further study by the naval authorities with a view to formulating a plan of campaign and policy of reform that best suits the changing condition of Japanese position in the international comity.

The battleship *Satsuma* which had been scrapped in accordance with the Washington treaty was sunk on September 2, 1924, near Oshima Island outside Tokyo Bay.

The *Satsuma* left Tateyama Bay early on the morning of September 2 in company with ships of the fleet. Firing began at 2 o'clock in the afternoon, the first shot fired by the *Kongo* carried away the stack of the *Satsuma* and then in turns the *Hyuga*, *Mutsu*, *Yura*, and *Yatori* fired until 3.40 p m. when she was sunk by torpedoes fired from destroyers Nos. 3, 5, and 7. At 4.50 p. m. the last torpedo was fired, which hit the ship amidships and she sank to the bottom a few minutes later.

The Yokosuka naval station authorities have been looking carefully into the hit that was most effective in blasting up the scrapped ship *Yuwami*, which was sent to the bottom after being made the subject of practical experiments with bombs and torpedoes dealt from airplanes on the waters 10 miles west of Jogashima off Misaki in Isu on the 9th and 10th. Of late, it has been made clear that the bomb dropped by 1st Sub-Lieutenant Tokunaga Okamura, of the Yokosuka air force, from the 1924 bomber piloted by 1st Sub-Lieutenant Mayeda, hit the vessel in the center and sent it to the bottom. His skill was praised by Commander in Chief Horiuchi and others. He is a flyer of great promise, though his every day conduct is often subject to criticism.

The new smoke stack, which was installed on the *Mutsu* for the purpose of eliminating the smoke nuisance in the conning tower, having proved satisfactory it is proposed to make the same alterations to the *Nagato*.

The repairs to the light cruiser *Kinu* have been completed and she will be put through official trials for one week commencing August 28, 1924, in the Bungo Channel. She has been under repair since December, 1923, at the Kure yard.

The ship was constructed by the Kawasaki dockyard in Kobe but defects having developed within the guaranteed period due to the use of poor materials the repairs to the *Kinu* at the Kure yard was done at the expense of the Kawasaki Dockyard Co.

The *Idzumo* while steaming out of Sasebo harbor on the morning of September 1, went aground. It was feared that she would capsize at low tide, but she was held at an angle of 30 degrees only by her anchors. Capt. Yoshiaki Yoshida who commanded the *Tatsuta* which rammed and sank the submarine *No. 43* is the commanding officer.

The *Idzumo* was successfully refloated on September 3. She sustained only slight damages but as she is in need of some repairs she will be docked at Sasebo.

The light cruiser *Kinu*, which was undergoing official trials in the Bungo Channel and while undergoing high-speed run test, developed trouble with her propeller shaft and was forced to return to Kure. Her second official trial has been indefinitely postponed.

Submarine *No. 24*, while cruising off Moji on July 29, collided with a small steamer, making a big hole in the bow of the steamer. The damage to the submarine was slight and she continued on her cruise.

FROM THE SEA TO THE SKY

Tokyo, July 22.—Japan's naval defence policy will receive a marked modification in future as a consequence of the experimental bombing operations of airplanes against the warship *Iwami* conducted some days ago off Yokosuka as one of the scheduled means of disposing of the scrapped warships.

The modification will be featured by a change of the naval strength from the sea to the sky. When the *Iwami* was to be made a target of airplane attack, a majority of the naval authorities and even experts who were in charge of inspecting the result of the operations were all agreed that a mere bomb attack from airplanes would be insufficient to send the vessel down to the bottom, and preparations had accordingly been made for administering her coup de grace by means of torpedoes from destroyers.

Contrary to their expectations, however, the *Iwami* sank after receiving only a few bombs from planes. In a special conference to be held early in September for final deliberation of the reform program, the authorities are thus expected to formulate a new defense policy for the navy that will mark a bold deviation from the old

policy of attaching such transcendent importance to battleships and a positive stride toward the concentration of defensive power in the sky.

Preliminary to the establishment of a flying base on the extreme point of Miura promontory for the protection of Tokyo from an air raid, the navy officials made an investigation of the site.

They visited Jogashima where the base will be located. The plans call for an initial expenditure of ¥250,000 for the erection of barracks and of tanks for gasoline. Another proposal under consideration is for the establishment of a base at Oshima Island in Tokyo Bay.

"The Hiro naval arsenal in Hiroshima prefecture will in the future be exclusively used for the construction of aircraft, all other work being transferred to Kure yard. The naval authorities have a plan to increase the number of workers there to 10,000."

Experiments having proved satisfactory, the Japanese Navy is contemplating putting small airplanes on her submarines. The planes will be equipped with a 60-horsepower motor, speed 105 knots, equipped with wireless and able to fly for three hours. Should the present plans materialize the submarines will be partially reconstructed. The tender *Chogei* is equipped to carry airplanes for use on submarines.

SUBMARINE AIR PURIFIER

All the Japanese submarine boats will in the future be equipped with the newly invented air purifiers, which, according to the authorities, will go a long way in promoting the efficiency of the submarine.

The submarine's radius of action, as well as its diving capacity, would be by far greater than at present but for the injurious gas constantly formed within the vessel because of the batteries and heavy oil used. The present invention removes such gas completely and thoroughly purifies the air inside the vessel by means of a specially prepared chemical compound which absorbs the impure air as fast as it is produced.

The invention is entirely original, according to the authorities, with the Kure naval port, where the device was invented, and has more than once been tried out with every reassuring result.

In the coming session of the Diet a bill proposing the installation of the invented air purifiers in all the submarines will be introduced.

Graduation exercises at the Naval Academy were held on July 24, 1924, and the following number were graduated: Line, 235; Engineering, 97.

FRANCE

GENERAL AVIATION SITUATION

September, 1924

French naval aviation is at a very low ebb as regards organization, personnel, material, and operation. A foreign air attaché had recently completed an inspection of French naval aviation activities, and an opportunity was had during the stay in Paris to see copies of his reports, which were in nearly all cases very unfavorable from a French point of view. In a discussion of his trip he stated that he regarded the general situation as "lamentable."

A visit was made to the aerodrome at Villacoublay, where there was an opportunity to inspect the latest types of French military airplanes. The types were in all cases either military or commercial airplanes and there was not sufficient opportunity during the inspection to obtain more than a passing impression. The new "Spad" combat airplane, equipped with 300-horsepower Hispano-Suiza engines and built by the Bleriot Co., was being given flight tests. This type has just been accepted, and it is understood that an order for a considerable quantity has been placed. The airplane itself has no unusual features and it is said to have no unusual performance. Top speed is believed to be about 155 miles per hour at ground level. After the test of the "Spad," a DeWoitene 300-horsepower Hispano-Suiza monoplane was flown for the education of the inspecting officers. The test pilot stated that in his opinion this plane as a flying machine was superior to the new "Spad." As a combat airplane it appeared to have limited visibility. The type is one which was adopted some time ago by the French for combat purposes and which is now supplied to several squadrons.

The Breguet combination bombing and 2-seater fighting plane was also seen. This plane is equipped with 400-horsepower Lorraine-Dietrich engine and is the type which was used by Lieutenant D'Oissy in his flight from Paris to Tokyo. Detailed descriptions have already been forwarded to the department. The airplane gives the impression of being a very useful type. Its performance is good and it is said to maneuver as easily as a single seater.

The hangars were filled with almost every conceivable type of airplane from the so-called single seater, light type, up to four-engine passenger carriers. Many rather freakish designs were observed and one was inclined to get the impression that the French Government would buy anything that would fly.

The military conduct of the aerodrome was not impressive. Discipline appeared to be slack and the entire place rather untidy.

The test pilots seemed to take advantage of every opportunity to show off and did many things which appeared foolish and unnecessary, such as opening up an engine full power without waiting for the mechanics to get clear after having cranked the engine, taking off immediately after starting without waiting for the engine to warm up, stunting low over the aerodrome, etc. Numerous accidents have occurred recently due to such tactics, and it is said that this spirit prevails throughout most of the stations.

It is understood that the bureau of aeronautics is especially interested in obtaining information about the Salmson air-cooled radial engine, and an effort was made to get such information. Nothing was previously known in a general way. It was finally ascertained that a test engine had been built and put in an airplane, and it was stated by one of the French officers that this engine had been flown for approximately 300 hours and, so far as he knew, had proven reasonably satisfactory. He stated that it was located at Chalais Meudon and that it was regarded as secret, but in reply to questions supplied a few details. It is a 9-cylinder engine of approximately 230 horsepower, and was described as being somewhat similar in design to the Jupiter. In view of these facts, especially the fact of the low horsepower, it is not believed that the bureau will be particularly interested in its development. It has passed a stand- and 50-hour test for 230 horsepower.

A visit was made to the "section technique" at Issy, where the assistant director was most cordial and open in his willingness to discuss technical problems. It is evident that the information from the bureau of aeronautics, which has been supplied during the past year, has been much appreciated and has made a friend as well as increased our prestige.

In the course of a general discussion of the design of naval aircraft it was made clear that the controlling consideration is strategic. It is present policy to assume that French naval aviation has two main missions:

1. Defense of the coast.
2. Maintenance of communication with north Africa.

It will be recalled that coast defense, including coast artillery, is under the navy. Coast-defense aircraft may be bombers or torpedo planes, and they will operate from a shore or harbor base. Consequently they are not restricted as to size or for any shipboard or transport condition.

Similarly planes used to keep open and to maintain communication with north Africa will be unrestricted as to size because operating from a shore or harbor base. However, long flights over water are required, and a premium is thus placed on reliability of power plant.

Fleet aviation proper does not exist and will not be pushed for the present. The carrier *Bearn* will not be completed for some time, and in the meantime the "section technique" has had no request from the navy to develop any type of shipboard aircraft for her. The new cruisers now building provide for compressed-air catapults of the United States type. The navy is developing its own catapult, but has made no request of the "section technique" to study a type of plane to go on the catapult.

As a result of this situation the types of bombing and torpedo planes for the navy are generally multiengine types of great span, and from our point of view of no use for fleet aviation. French engines are not distinguished for reliability, and this feature, combined with a desire to use up surplus stocks of old engines, has led to cumbersome 3, 4, 5, and 6 engine types. Great stress has been laid on ability to fly with some engines dead.

Experience with multi-engine planes has led to the belief that three is the best number of engines to use, except for torpedo planes, when two is satisfactory. In the torpedo plane, after dropping the torpedo, one engine should be enough to maintain flight.

The Salmson 230-horsepower air-cooled engine was said to be very good and to have passed "all tests." It is too low powered for a single-seater fighter, but very suitable for a multi-engined type.

Transport by air between France and north Africa is of great interest and large multi-engine airplanes are considered most suitable in order to avoid a forced landing.

It is of interest to note the design of the "commercial" machines which competed in the "Grand Prix des Avions de Transport."

Farman "Jabiru" FX–3, thick-wing monoplane, 19 m. span, 6 m. chord at center, area 81 m², 12 passengers, 2 pilots, radio, baggage, night-flying equipment, 4 Hispano 180-horsepower engines mounted in wing with tanks, fly on 2 engines, start on 3 engines.

Speed at sea level	209 km. h.	Climb to 1,000 m.	in 6 min. 16 sec.
1,000 m	206 km. h.	2,000 m.	in 14 min. 14 sec.
2,000 m	201 km. h.	3,000 m.	in 26 min. 11 sec.
3,000 m	192 km. h.	4,000 m.	in 57 min. 22 sec.

	Kg.
Deadweight	3,334
Radio	120
Load	1,010
Oil	72
Fuel	664
Gross	5,200

The same machine has been tried with three water-cooled 300-horsepower Salmson engines and also with two Lorraine 400 horsepower.

The Bleriot 135T is the four-engine biplane, type 115, of last year, with the four Hispano 180-horsepower engines replaced by four Salmson 230-horsepower air-cooled engines. The engines are mounted 2 on the upper wing and 2 on the lower. The characteristics are: Span, 25 m.; length, 14.5 m.; area, 126 m.²; weight, empty, 3,000 kg.; useful load, 2,500 kg.; gross weight, 5,500 kg.; power, 920 hp.; speed at ground, 180 km. h.; ceiling, 4,100 m.

In the competition the Farman was classed first and the Bleriot second. A Caudron entry failed to qualify. The trials consisted of three separate round trips, Paris-Bordeaux, or about 3,000 km. The average speed of the Farman was 179.4 km. and the Bleriot 146 km.

Airships in France appear to be dead since the Mediterranean disaster, but the airship personnel is kept on research work and is hopeful of getting a chance to develop rigids if the British go ahead as announced.

The military side of aviation is active and progressive. A good deal of building of both planes and engines of radical types is going on under the direction of a special experimental board, but the adoption for service of a new type is most conservatively handled. The "Fonck" engine, reported on before, is an example of a radical type financed by the board. This engine has not yet been submitted for test.

The engine type test of 50 hours is now being made 100 hours for new types in an effort to force greater reliability. The results of this change of policy will not be felt until next year, when a number of new 500–700 horsepower water-cooled engines will come out.

Racing appears to be a matter for private firms. The "section technique" seems to have nothing to do with it. The following data was obtained relative to the Nieuport-Delage sesquiplane type 42 (Beaumont cup):

	m.
Length	7.3
Height	2.2
Span	9.5
Chord	1.7

	kg.
Weight empty	1,170
Pilot	90
Instruments	10
Fuel	170
W gross weight	1,440

$\frac{W}{A}$=93 kg.

$\frac{W}{P}$=2.4 kg.

Areas	14.0 upper wing.
	1.5 lower wing.
	1.6 ailerons (incl.).
	1.8 stabilizer.
	.75 elevator.
	.70 fin.
	.40 rudder.

Engine: Hispano 12 cyl., 140 x 150 in V, giving 600 HP. at 2,000 R. P. M.

ITALY

NAVAL MANEUVERS

August, 1924

In the event of being cut off in the Mediterranean, the problem set out for the Italian fleet maneuvers consisted in convoying food and ammunition from the East.

A convoy has been loaded at Tobruk and must reach some port in Sicily, Taranto, or Siracusa. The "enemy" fleet left its base in Sicily at mid-day the 20th under Admiral Conz, headed by the submarines *F* and *N* coming out of Trapani, heading for their destination midway between Malta and Capo Passero Dalla. At 11 o'clock that night the entire enemy fleet rendezvoued at the above location. The subchasers, however, could not keep the sea and had to be ordered back to Trapani. This was a considerable loss to the fleet (3 subchasers).

From Capo Lilebeo Admiral Conz's fleet headed toward Linosa Island. This route was selected to evade submarines hiding possibly to the north of Malta, and also the difficulties of navigating the Pantelleria Canal which could be easily mined. For these reasons the fleet kept in deep water as much as possible. It was also suspected that the convoy would be cut off somewhere along this route as it was the most convenient toward Sicily.

At 12 o'clock the 20th, the 10 destroyers assigned the attacking fleet were at Porto Empedocle with the flotilla leader *Pepe* and 4 seagoing submarines. These latter, however, about 1 o'clock, left port; the *Mocenigo* toward Siracusa and the other 3 toward Tobruk.

The *Moncenigo* should have been sent, however, according to the judges, on exploration duty along the coast of Cirenaica to shadow the convoy. At 5.30 a. m., the 21st, 3 destroyers left Porto Empedocle and joined the large ships of the attacking fleet, flanking them as a protection against subs. Three other destroyers, *Confienza*, *Palestro*, and *Cosenz* left Porto Empedocle at midnight of the 21st and headed toward the southern coast of Malta to protect the left flank of the attacking fleet. No news yet of the convoy. Considerable activity of the national air forces. At 8.20 a. m. a submarine was sighted by the *Confienza*. At 10 a. m. the submarine *S 5* of the nationals torpedoed the *Palestro*, which was ordered to return to port. With the loss of the subchasers and the flotilla leader, the enemy fleet found itself inferior to the nationals. Special orders were given to avoid possible submarine nests and that the nationals were probably waiting in force to the south of Malta.

Near Linosa the attacking fleet modified its route a couple of points north, heading thus for the established rendezvous of the en-

tire fleet, about half way between Augusta and Tobruk. Enroute the fleet was signaled by nationalists air squadrons at 11 a. m. the 21st. The submarines *S 19* and *N 5* had to be towed to Porto Empedocle. Another loss for the attacking fleet. This, with the uncertainty of coming up with the squadron headed by the flotilla leader *Pepe*, caused a feeling of hopelessness in the "enemy" fleet.

Aerial scouts of the "enemy" fleet reported that the grand fleet of the nationals had left Augusta, but the reports reached Admiral Conz too late to be of any use.

The convoy was sighted by the enemy submarine at 1 o'clock a. m. the 21st. This sub, the *Barbarigo*, left Navarino the night before (a "neutral" port) and cruised about Tobruk. It was learned later that the convoy was sighted by the flotilla leader *Bixio* and destroyer *Audace* as heading for Taranto. The *Bixio* radioed later that the dreadnoughts of the nationals were on S/W course heading towards the convoy. It seems that the nationalists did not try to destroy the enemy fleet, but preferred the defensive and joined the convoy first.

During the afternoon of the 22d the *Bixio*, *Audace*, and *Barbarigo* were attacked by the destroyer flotilla of the convoy, but the attack was judged as repulsed. From this time on the chances of the "enemy fleet" went from bad to worse.

The convoy was sighted to the west of the island of Candia, about 70 miles from the coast, headed for Taranto. This caused Admiral Conz to change his course. At 1.30 p. m. on the 21st the enemy attacking fleet was headed for Zanta with a double objective—to get between the convoy and the national fleet, and at the same time enter neutral waters to refuel destroyers, etc. The *Marsala* sent urgent message to the *Pepe* and 3 destroyers that had gone to Lampedusa to refuel after having cruised for several days about Malta. Without this squadron the enemy would have found itself completely outclassed now in a battle with the nationals. The refueling at Zante, begun in the afternoon of the 23d, was suddenly interrupted by the report that one of the nationals' subs had made its appearance (about 10 miles distance). The destroyer *Monzambano* was sent to attack the sub, but at 7.30 p. m. one of the "H" type submarines came to the surface about 200 meters from the dreadnought *Dante Alighieri* and announced that she had "torpedoed" the *Dante*. This attack and the report of other subs to the south caused the admiral to suspend refueling and take to the open. The torpedoing of the *Dante* was not allowed because the regulations prescribe that the sub after having been sighted first by the *Barbarigo* should have traveled 10 miles before emerging and beginning the second attack.

The convoy was lost sight of. Admiral Conz decided to divide his fleet into three groups—the *Bixio* and *Audace*, headed for Santa

Maria de Leuca; the *Caesare*, *Dante*, and 3 destroyers towards Cape Colonna, and the *Marsala* and 2 destroyers for Point Stilo. But nothing came of this maneuver except risking single destruction of each group. So the entire fleet was ordered to head for Cape Colonna, which was sighted at 9.30 a. m. the 24th. The squadron headed by the *Pepe*, for lack of fuel and food had to head for Navarino, thus being unable to come up with its main fleet for scouting duty, and were considered as actually withdrawn from the fight. The enemy fleet were unable to get in touch with the convoy, either by radio reports of its scouts or by air. The last scouting work was done by the destroyer *Confienza* during the night of the 23d and 24th. Negative.

The morning of the 24th word was received that the convoy had safely entered Siracusa, but that the national fleet, which was to escort it, had anchored at Augusta and Admiral Acton had ordered the suspension of hostilities.

The naval critics are unanimous in blaming the defeat of the attacking fleet to the fact that the navy lacks destroyers capable of keeping the sea (Mediterranean). It was said that the best of them could not keep the sea more than four days without refueling.

CENTRAL AND SOUTH AMERICA

STRATEGIC ESTIMATE

September, 1924

[Prepared by a committee at the Army War College]

This survey is based on the geographic, political, economic, and military situations of the Central and South American States and the consideration of the military significance of these situations.

(I) MILITARY ASPECTS OF THE GEOGRAPHIC SITUATION AND ITS PHYSICAL GEOGRAPHY

CENTRAL AMERICA

Central America, consisting of a number of small, independent states with no political union, is of interest to the United States only on account of the proximity of these states to the Panama Canal, probable future necessity of constructing an interoceanic canal through Nicaragua, and of the possible use of harbors on the west coast as naval bases by larger powers at war with the United States.

The high central mountains that trend from northwest to southeast divide the country into two parts, which experience difficulty in

communicating with each other. The coast regions are also low lying, swampy, and tropical in vegetation which causes communications between north and south to be difficult. The sparsity of the population and the difficulties of communications have caused the people to group themselves around a few centers, communication between which is limited.

The seacoast on the Atlantic is undefended, swampy, and sparsely inhabited. About one-third of the Honduras coast and more than half of the Nicaragua coast line is inhabited by Indians only. The harbors are few and poor.

On the Pacific the harbors are better. Fonseca Bay, Culebra Bay, the Gulf of Nicoya, and Golfo Dulco are potential bases for fleets attacking or defending Panama Canal.

The Central American Republics have been called "banana republics." The chief products are bananas, grown near the coast, and coffee, on the mountain slopes.

There is no natural defense for the coastal areas.

The most probable theaters of operations for the United States against any of these republics are the stretches of country between, or capitols, and the nearest seaport possessing rail communications therewith.

The size of the armies is determined by the needs of maintaining order within their own borders rather than offense or defense against neighbors. Salvador only need consider to any great extent the question of defense against neighboring states, as she is surrounded by the three largest states.

SOUTH AMERICA

Colombia.—Occupying the northwest corner of South America, with both a Pacific and Caribbean seacoast, Colombia's position is strategic with respect to the Panama Canal. Her position eliminates war probability with any of the South American states, except Venezuela, Ecuador, and Peru. The difficulty of reaching any vital area through invasion of her land frontiers lessens the chances of aggression on the part of her neighbors.

She has only two important harbors on the Caribbean—Cartagena and Puerto Colombia—and one on the Pacific, Buenaventura. These are connected by railroad to cities on the Magdalena and Cauca Rivers. Access to the interior is by these rivers.

The productive centers are Bogota and Medellin, industrial and mining; Cucuta, on the Venezuelan border, coffee; and the seaport towns of Barranquilla and Cartegena. There is no natural defense from the sea.

The most probable theaters of war are: With Venezuela, the border at Cucuta; with Ecuador, the region from Pasto to Quito: with the United States, the seacoast towns. The seacoast is hot and unhealthy. Temperature, about 95° F., is reached daily. Landing places for expeditionary forces into the interior are Barranquilla, at mouth of Magdalena, and Buenaventura, thence by rail to the Cauca River.

Brazil.—Brazil's land boundaries are remote from her centers of population, and this, with the character of the frontiers, constitute barriers of great strength. The only exception is the boundary between her and the States of Urugnay, Paraguay, and Argentina. Her frontiers here are open to invasion.

The seacoast of 4,000 miles has a number of important harbors and ports at which expeditionary forces may land. The most favorable are Rio de Janeiro, Santos, and Rio Grande du Sul, as railways connect these ports together and lead to the great centers of population and industry.

These great centers are the areas lying adjacent to these ports. Rio, Sao Paulo, and Santos are centers of coffee trade; Rio Grande du Sul for agricultural and cattle production; Para and Manaos for rubber export.

The most probable theater of war is Rio Grande du Sul, Uruguay, and adjacent Argentine territory. The climate is fairly healthy and temperate. In case of attack from the sea, the states of Rio Janeiro and Sao Paulo would also be involved, as these are vital areas, and attack would be directed there.

Brazil's position causes her army to be kept to a strength sufficient to protect her from attack by Argentina. Her length of seacoast and oversea trade requires her navy to be relatively larger. Her policy is to be as strong at sea as Argentina.

Chile.—Chile's remote geographical position eliminates chances of war with countries of other continents. Her size, resources, and slight density of population eliminate the chances of war with her neighbors for economic reasons.

The barriers of the Andes protect here from attack on the east except through passes which can be blocked. Her northern frontier is a desert country. Access to Chile by land is difficult.

Her long seacoast is exposed to attack by a maritime nation. The harbors are Arica, Iquique, Antofagasta, Valparaiso, San Antonio, Concepcion, and Punta Arenas.

The landing places selected for expeditionary forces depend upon the object of the expedition. To seize the nitrate region landings at Antofagasta and ports to the north are sufficient. Valparaiso and San Antonio, connected by rail with Santiago, are the best harbors for landing an expedition, as they are partly protected.

The coast range protects the central valley to some extent. The production areas are scattered along the state—nitrates and copper in the north; agricultural and pastoral in the center; coal in the vicinity of Concepcion-Coronel, and in the south sheep raising.

The most probable theater of war is the central valley, lying behind the coast range. Invasion routes to this valley from the east are through the Andean passes; from the sea by short railways and trails from the seacoast. Temperature varies with altitude. Punta Arenas, in the Strait of Magellan, would probably be attacked.

The barrier of the Andes has caused her to expand north rather than east. This has brought her into conflict with Peru and Bolivia. The necessity of protecting her long seacoast and keeping possession of what she has gained in former wars with Peru and Bolivia fix the size of her army and navy.

Argentina.—Argentina is isolated from other important states except Brazil and Chile, which reduces the chances of war. Her resources, size, and slight density of population exclude the necessity of war with her neighbors for economic reasons.

Argentina's western boundary forms a great barrier between her and Chile and part of Bolivia. The distance from this barrier to her vital areas on the Atlantic is also a factor in her defense. The northern frontier is open to invasion through Uruguay and the Brazil frontiers and Paraguay.

The seacoast (1,565 miles in length) is low lying in the north and rather bolder and higher in the south (Patagonia). There are few good harbors. The principal ports are Buenos Aires, Plata, and Bahia Blanca (Puerto Militar). Smaller ports in the south are not connected with the vital areas by railroad, and are of less importance.

The centers of productive areas are reached by rail or river from Buenos Aires. They are Rosario, grain and cattle products; Tucuman, sugar; Mendoza, wine and grapes. Buenos Aires and Bahia Blanca are centers for agricultural and pastoral products (grain, wool, hides, beef). There is no natural defense from the sea.

The most probable theaters of war, in case of attack by land, are Uruguay, Entre Rios, and Carientes Provinces and Rio Grande du Sul (Brazil). The direction of attack by Argentina on Brazil would be through Rio Grande du Sul and up the Uruguay River. The climate is healthy, the country in places wooded and marshy.

From the sea an attack would be made at Buenos Aires, La Plata, or Bahla Blanca, and possibly at all of them.

In case of war with Chile, Mendoza and Nequen Territory would be the Argentine theaters, as the principal passes through the mountains are found here.

Against Bolivia, an advance would probably follow the railroad north through Jujuy.

Protection of her coast line and her Brazilian frontier are the principal factors in determining the size of her army and navy.

Venezuela.—Venezuela's isolation from other countries eliminates chances of warfare with them. The physical barriers of the branches of the Andes on her Colombian frontier protect her from her western neighbor. Mountains and unexplored country separate her from Brazil.

Venezuela's seacoast on the Caribbean Sea is indented by many bays and gulfs. The mouth of the Orinoco on the Atlantic is a delta. The Maritime Andes parallel the Caribbean Sea coast and protect the interior from invasion. The principal ports are La Guaira, Puerto Cabello, and Maracaibo. The first two are probable points of landing of expeditionary forces; roads and railroads connect these points with Caracas and Valencia.

The great centers of productive areas are Caracas (industries) and the Lake Valencia valley (agricultural), Maracaibo (oil), and the Guiana highlands (mining). The routes of invasion to these points are from La Guaira and Puerto Cabello with the Lake Valencia region, and Lake Maracaibo.

The most probable theaters of war are in the Lake Valencia valley (Valencia-Maracay-Caracas) and the Maracaibo Basin. The temperature and climate of the latter are execrable. The Lake Valencia valley is hot, but not unhealthy as Maracaibo; Caracas is cooler (5,000 feet high).

Uruguay and Paraguay.—These two states are buffer states between Brazil and Argentina. They will probably be drawn into any war involving these two.

Uruguay has no natural defenses except her river lines and arroyos. Paraguay's defenses are her river lines, swamps, and forests, which are very serious obstacles to movement of troops.

Uruguay has a seacoast on the Atlantic and the La Plata River, which is practically an arm of the sea. Paraguay is inland. Montevideo, the capital of Uruguay, is a seaport and is the best place for the landing of an expedition from the sea. The approach from the sea to Paraguay is up the Parana River. Asuncion, the capital, can be reached by vessels of 12-foot draft.

Most probable theater of war: The whole state of Uruguay would be involved, the lines of invasion from land leading to Montevideo. Asuncion would be the objective of any invasion of Paraguay.

Peru.—The geographic position of Peru in respect to Chile, with whom she has a boundary dispute, gives rise to the only probability of war.

Her long seacoast line renders Peru subject to attack from the sea by any nation having a navy large enough to overcome Peru's naval forces. There are few good harbors. Callao and Truxillo are the most important. The former would be the probable landing place of an expeditionary force, as it is only 7 miles from Lima, the capital, and connected by road and railway with it. Callao and Lima would be the objective.

The principal agricultural area is west of the Andes along the coasts. Arequipa, near the Chilean frontier, is an important center. Coffee grows farther inland on the mountain slopes. Callao and Lima are the industrial centers. The seacoast is open to attack, but the Chile border is short and difficult. The Bolivian border is mountainous north of Lake Titicaca and swampy along the lower reaches of the rivers to the south. Lake Titicaca is navigated by a line of Peruvian vessels.

Probable theaters of war: In case of war with Chile or the United States the ports of Callao and Lima would be attacked. In case of war with Bolivia, Peru would probably attack across Lake Titicaca against La Paz, using her steamers and the Mollendo-La Paz Railway line. This area is high and cold, but not unhealthy.

Ecuador.—The position of Ecuador eliminates any probability of conflict except with Colombia and Peru, with both of whom she has boundary disputes. The Gallapagos Islands are a dependency, the possession of which by any of the large powers would be a threat against the Panama Canal.

Her frontiers east of the Andes are difficult to penetrate on account of the jungles. Her Colombia frontier in the Andes and west of the same is difficult to defend, being rough and mountainous. Colombia can reach it more easily than can Ecuador. The Peruvian frontier west of the Andes, while difficult, could be penetrated at Loga, from which point a road runs toward Quito.

The coast has only one good harbor, that of Guayaquil. This would be the landing place of any expeditionary force from the sea, as the possession of the seaport would be sufficient to decide the war without marching to Quito.

The principal cities are Quito and Guayaquil. Quito is 280 miles inland and is reached by railroad and road. It is protected by a barrier of hills and mountains. The harbor of Guayaquil is not defended.

Ecuador's position and small size render unnecessary a large army. The mission of her land force is to preserve internal order. She favors arbitration in her boundary disputes.

Bolivia.—Bolivia's inland situation eliminates all probability of war except with adjoining states, with two of which, Peru and Paraguay, she has border disputes which are not likely to result in war.

The Bolivian frontiers are extensive and difficult to penetrate on account of the jungles, and the country is sparsely settled. The Peruvian border is difficult to cross except by way of Lake Titicaca, the transportation on which is controlled by Peru. With Chile, the Andes form a barrier, passable at only a few high passes. The frontiers bordering on Argentina and Paraguay are open.

The high plateau region of Bolivia (12,000 feet altitude) is the important commercial region. The principal industry (mining) is conducted here. The nature of the frontiers protecting this area has been described.

The Chaco region is the most probable theater of war with Paraguay. This is a vast plain with few trees and little water and is very hot. The country is of no military importance so far as the United States is concerned.

(II.) POLITICAL SITUATION

In the discussion of the political situation of Central and South America the countries will be, in the main, considered as one. In all countries except Brazil the first exploration and colonization was done by the Spaniards, who fixed the language and customs.

Racially the population consists of a few whites, many people of Spanish-Indian blood and many pure-blooded Indians.

Argentina has received more than four million immigrants, mostly Italian, Spanish, and French. She is essentially white.

Brazil is Portugnese in language and customs. She has received more than two million negro slaves and very many Italian, Portuguese, Spanish, and German immigrants, some of whom retain their native languages and customs. She is white in the south and black or Indian elsewhere--mostly black. The Portuguese themselves are somewhat negroid.

The mixing of races has, as a rule, resulted in a weak people. They are proud, sensitive, lacking in industry, unambitions, and impractical. The majority are illiterate and illegitimate. Due to lack of early training and discipline they do not take kindly to military discipline. Many of them are alcoholic and diseased. Their birth rate is high, as is their death rate, particularly among infants. Due to sharp distinctions of wealth, culture, occupation, and political influence, they are not homogeneous.

On account of their lack of national spirit, or solidarity of training or resources, they could not sustain a protracted war.

All of these countries are republics, with a constitutional and supposedly representative form of government somewhat similar to ours. In most of them, however, the states or provinces do not have the independence that our states enjoy. Political power is in the hands of the few educated whites or near whites.

The political parties are, in effect, Conservative or Liberal.

The Conservatives support the Roman Catholic Church, are opposed to any reform of land laws or of taxes. In general they, being in power, desire no changes.

The Liberals favor anything that the Conservatives oppose.

The political issues are questions relating to the power of the church, land taxes, revision of customs duties, reforms benefiting the working class, and such other questions as naturally arise between educated and illiterate people.

Their foreign questions are generally boundary disputes, such as those between Chile and Peru and Panama and Costa Rica.

Relations with great powers are unimportant except when questions relating to payment of foreign loans arise.

National policies are practically nonexistent. They drift from one administration to another; this is particularly true in Central America.

As most of these countries depend on their customs duties for their federal income they could not afford to jeopardize their foreign trade by being hostile to the United States in the event of our becoming involved in war with Red, Red-Orange, or Green.

The A–B–C countries on account of their greater importance will be discussed separately.

Argentina.—Argentina's government is in form rather similar to ours, although the Provinces have not as much power as our States. The people are better educated than in most of the other states, more of them take an interest in public affairs, and there is quite a strong national feeling, as all, even recent immigrants, are very patriotic.

Argentina could probably wage a protracted war with any one other state in South America.

There are several political parties. The Radicals, now in control, and the Socialists, the opposition, are the strongest.

Argentina has recently had rather serious strikes and labor disputes over labor questions. There are many demands for reforms of land laws, an income tax, and reduction of public expenses.

Argentina has no alliances. She favors arbitration as a means of settling disputes, and has suggested limitation of armament to Brazil. German and British influence is strong.

The Argentinians are suspicious of us. They profess to believe that we desire to dominate them. In their pride they resent the Monroe Doctrine. Their press is commenting rather bitterly on the American naval mission to Brazil, claiming that Brazil is becoming aggressive and forcing naval competition on the states of South America. Although she does not like us, she would probably remain neutral in case we became involved in war with Red, Red-Orange, or Green.

If Argentina has a national policy it may be said to be her desire for leadership among South American states.

Brazil. Brazil's government is patterned on ours; but her states have much more power than ours. In fact, they have so much power that state feeling is stronger than national spirit.

Due to her huge size, poor facilities for transportation, and communication, lack of education, diversity of races, and lack of cohesive government, there is no strong spirit of nationality.

Solely on account of her much greater population it is probable that Brazil could sustain a protracted war as well as any other South American state.

There are no real political parties, consequently no real internal political issues.

The present insurrection, which is practically subdued, has no real political significance. The army was opposed to the present administration and particularly the President, who had appointed civilians as ministers of war and marine. A small number of troops revolted in Sao Paulo. Their platform appealed to the laboring class, who objected to low wages and high living costs; also to those who favored the secret ballot and reform of customs duties.

Aside from her rivalry with Argentina for leadership in South America Brazil has no foreign complications. Her attitude is pacific. She believes in arbitration. She joined the League of Nations and favors the Permanent Court of Justice.

Her relations with the United States have always been friendly and are becoming more so. She supports the Monroe Doctrine. Brazil would probably favor us should we wage war against Red, Red-Orange, or Green.

Chile. Due to their hitherto stable government, knowledge of their fighting ability, and pride in their army, the Chilians are classed as a homogeneous people. Their government is highly centralized and could probably stand a protracted war better than any other South American state.

The Liberal Party is in control. A group of army officers have, in the past two weeks, forced their congress to pass several reform measures which the President could not put through. The President has resigned and left the country. A nonpolitical ministry has been formed and a member of the military party, who was minister of the interior, has according to law, assumed the presidency.

Chile, due to her geographical position, has no important foreign relations. British and German influence is strong.

As Chile relies almost entirely on her foreign trade for her income, it is believed that she would remain neutral in case of war between the United States and Red, Red-Orange, or Green.

The national policy right now seems to be "Reform that will result in all-around national progress."

It is believed that the political situation in Central and South America is not of very great importance to the United States.

(III) ECONOMIC SITUATION

CENTRAL AMERICA AND COLOMBIA

From an economic point of view this group of countries (except Colombia) is of little economic importance to the United States. Sparsely populated by an ignorant and apathetic people, with poor communications and large areas of swamp, jungle, and mountain, little agricultural or mineral wealth is produced. However, a favorable climate and good soil promise great possibilities for future development, while mineral wealth is known to exist over wide areas.

Raw materials.—Central America, in its present stage of development, is very deficient in raw materials, except certain foodstuffs. Guatemala, Salvador, Nicaragua, and Costa Rica produce large quantities of coffee, most of which finds a ready market in the United States. Colombia is of more economic importance than the Central American states, and contains many of the major raw materials needed for modern industry and modern war, although only slightly or partially developed. It is already of considerable importance to the United States as a source of raw materials. In addition to being the second country in the world in the production of coffee, she now leads the world in the production of platinum. Hides are also important exports.

Food.—Although these countries have a favorable climate and good soil, only Guatemala and Salvador could be called self-supporting in foodstuffs.

Industries and munitioning capacity.—In general, this group of countries possesses but few available raw materials, while the few primitive factors are sufficient only for the simplest local needs.

Foreign commerce.—Practically all of the group under discussion have one big money crop upon which they rely for their economic salvation. For example, Honduras is the greatest banana producer in the world: Guatemala, Salvador, Nicaragua, Costa Rica, and Colombia depend upon coffee, supplemented to some extent by sugar for their prosperity. Panama is dependent upon bananas and hardwood.

As might be expected from the backward stage of development of these countries, their principal imports are cotton textiles, foodstuffs, and manufactured articles of various descriptions.

The United States occupies a commanding position in this commerce, followed by England and Germany.

Finance.—With the exception of Salvador and British Honduras, the financial situation of this group of countries is bad, to say the least. Due to disturbed political conditions, lack of industrial development, a sparsely settled country, and a backward people, the currency is depreciated, bonded debts are not paid, foreign exchange is high, and credit is bad. Colombia, however, has some hopes of pulling herself out of the usual Latin-American financial slough.

Communications.—From a military viewpoint the important railways in Central America are those connecting the capitals with the seaports and the coast-to-coast road through Costa Rica from Port Limon on the Atlantic to Punta Arenas on the Pacific. Guatemala also has an ocean-to-ocean road. The railroad mileage is small and the gauge generally narrow.

The roads are mostly unimproved. They are few in number. Almost all travel is by ox carts or pack transportation.

Telegraph lines connect the principal centers of population, and telephone systems have been installed in the capitals. Radio stations of short radius are installed in each country. None are powerful enough to reach the United States. Cables connect all except Honduras with the United States.

Colombia's communications inland are by river, connecting with short railway lines running from Puerto Colombia, Cartagena, and Buena Ventura. The Magdalena and Cauca are navigable with difficulty in the dry season. Steamers of 4½-foot draft are used to the rapids 1,000 kilometers from the mouth. Rapids here prevent further ascent.

Roads are few and poor. Telegraph lines connect the capital and principal centers and seaports. Cable connection at Cartegena and Buena Ventura, and radio, connects Colombia with Colon.

West coast of South America less Chile

ECUADOR, PERU, BOLIVIA

From a military-economic point of view this group of countries merits closer attention than Central America. This is especially true of Peru and Bolivia, both of which have a promising economic future.

Raw materials.—Ecuador is a one-crop country, cacao being the only product of importance. Peru has a considerable amount of useful raw materials. Hides, wool, cotton, rubber, and petroleum

are produced in quantities amply sufficient for her needs in peace or war—of which wool, hides, and rubber are useful to the United States. It is to be noted that Peru is the world's principal source of vanadium. Bolivia has immense potential mineral resources, and produces tin, zinc, copper, lead, tungsten, and antimony only in commercial quantities. As she has no seaport, her ability to import necessary raw materials depends upon the good will of Chile. As a source of raw materials for the United States Bolivia is chiefly valuable for her immense production of tin. Other products of value to the United States are antimony, tungsten, wool, hides, and rubber.

Food.—All three countries are essentially self-supporting in foodstuffs, but there is little surplus.

Industries and munitioning capacity.—Neither Ecuador or Bolivia have any factors worthy of the name. Manufacturing of some importance is now being carried on in Peru, chiefly smelting and cotton, woolen, and flour milling.

Foreign commerce.—Foreign commerce is vital to the three states under consideration. Ecuador depends upon cacao for its economic prosperity; Peru upon petroleum, cotton, and sugar: Bolivia upon tin, silver, and copper. All of them import cotton textiles, flour, and manufactured products generally. The United States is the leader in this commerce, followed by Great Britain and Germany.

Finance.—In spite of undoubted resources, all of this group of countries have experienced financial trouble for years. Ecuador's finances depends upon the market price of one crop, cacao, and the foreign exchange; while Peruvian finances are fundamentally sound, her exchange has fluctuated badly and there is usually a deficit in the budget; Bolivia has experienced much political instability and has been forced to borrow large sums abroad on account of deficits in the budget.

Communications.—A railroad line connecting Guayaquil and Quito (280 miles) forms the principal road. The total railway mileage is 413. Highways between these two points have been improved for 115 miles. The total telegraph mileage is 4,360. Quito is connected with the coast and the neighboring states. Wireless also connects the two leading cities. Guayaquil has a telephone system.

Peru's railway mileage is 1,980 miles, all standard gauge except three short lines. There are 578 miles of motor roads in operation or planned. The Marconi Co. controls telegraph and wireless. The total length of telegraph line in 1920 was 8,817 miles. There are 19 wireless stations.

The railroad mileage of Bolivia is 1,401 miles. The most important railroad lines are those connecting La Paz with the Pacific ports. There are cart roads connecting the most important towns. Tele-

graph lines total about 4,000 miles and connect La Paz with other important towns on the high plateau and a few border sections. Wireless is depended upon to reach most of the border towns.

East coast less Brazil and Argentina

VENEZUELA, URUGUAY, PARAGUAY

This group of countries is agricultural and pastoral and of little economic importance to the United States, except that it might be worth while to deny their meat products to an enemy.

Raw materials.—Uruguay and Paraguay have very few raw matetials available for war, with the exception of animal products. The only raw materials produced of value to the United States are hides.

Venezuela, in addition to animal products, produces coffee, cacao, rubber, and petroleum, all of which except petroleum are useful to the United States.

Food.—All three of these countries produce an abundant supply of meat, but for that reason, largely, agricultural products, while usually sufficient for local needs, show little surplus.

Industries and munitioning capacity.—This group shows a lack of raw materials needed in industry, with the exception of Venezuela, and none have any factories worthy of the name.

Foreign commerce.—Although the foreign commerce of this group is comparatively small, it must be remembered that the population is small and that their foreign commerce is very necessary to their existence, as a large part of the government's revenue is derived from the customs.

All have enjoyed a favorable trade balance during the past few years. The United States leads in trade with Venezuela, Great Britain with Uruguay, and Argentina with Paraguay. While Uruguay and Paraguay export animal products only, Venezuela has a thriving trade in rubber, coffee, cacao, and petroleum.

Finance.—Uruguay and Paraguay have large foreign debts, labor troubles, and an unfavorable rate of exchange, all of which militate against a sound financial situation. Venezuela is in much better condition than the majority of Latin-American countries. The currency is sound, and the public debt comparatively small.

Communications.—The railroad mileage of Venezuela is 661 miles, all north of the Orinoco. Roads have been improved. Caracas is connected with La Guaira, Valencia, and Puerto Cabello. Other important roads are projected. Telegraph connects the important centers. Cable to the United States is via Caracas and Santo Domingo.

Railroad communications in Uruguay are good, the system joining the Brazilian system, giving Montevideo communication with Rio de Janeiro. The total length of line is 1,625 miles standard gauge.

Roads are good. There are over 300 miles of macadamized roads, 2,240 miles of national, and 3,100 of departmental road.

Telegraph lines total 4,819 miles. Cables at Montevideo connect with the outside world. Telephone systems also serve Montevideo.

The only public railway in Paraguay is 117 miles long, standard gauge, connecting Asuncion with Encarnacion, where a train ferry takes it over the Parana River and connects with Argentine lines.

Roads are practically nonexistent. The rivers (Paraguay and Parana) are navigable for light steamers above Asuncion. Telegraph lines connect Asuncion with the outside world. There are 1,436 miles of wire. There are four wireless stations.

CHILE, ARGENTINA, BRAZIL

This group of countries differs greatly from other states of Central and South America. With comparatively stable governments, rich resources, and a population appreciably augmented by Europeans, they are already factors in world economics and promise to be even more so as further development follows increased population.

CHILE

Raw materials.—Chile's material resources are important to every considerable country in the world. She is the chief source of the world's nitrate supply and ranks second in the production of copper. Meat, wheat, wool, and hides are also produced in abundance. As a source of raw materials, Chile is chiefly valuable to the United States for her nitrates, though her wool and hides are useful.

Food.—Chile is self-sustaining in food, except for rice, sugar, coffee, and tea. There is a large exportable surplus of meat, wheat, and other cereals.

Industries and munitioning capacity.—While Chile has a respectable amount of raw materials, her manufacturing capacity is not sufficient to turn them into finished products. Forty per cent of her factories produce food products and 10 per cent leather goods, leaving a wide variety of articles that must be imported.

Foreign Commerce.—Chile's financial existence depends almost entirely on foreign trade and any interruption in the nitrate export would be ruinous. Nitrates and copper make up about 80 per cent of her total exports. Imports are chiefly cotton textiles, machinery,

and petroleum. The United States leads in Chilean trade, though Germany is again becoming an important factor.

Finance.—Chile's revenue comes almost entirely from her nitrate export, but little revenue being obtained from taxation. Any fall in the nitrate trade brings a budgetary deficit which is usually covered by a foreign loan. As 22 per cent of the state income goes for national defense and 45 per cent for interest on the national debt, it is difficult to see how the financial condition can improve unless some form of an income-tax bill is passed, which at present appears difficult of accomplishment.

Communications.—Chile's natural lines of communication is the sea from port to port. The railroad through her long central valley supplements this. Branches from this line reach all important ports as far south as Puerto Montt. She has almost 5,300 miles of railway lines. The Trans-Andean lines to La Paz and Buenos Aires connect her with other states. Roads are poor and are fit for ox carts only, except in the vicinity of large cities where short stretches of wagon road exist. Pack transportation almost exclusively is used in the Andes. Radio and cable connect Chile with other countries. Telegraph lines connect all important points.

ARGENTINA

Argentina is essentially an agricultural and pastoral country, producing an enormous supply of agricultural and meat products.

Raw materials.—Argentina has few material resources except hides, wool, and food products. However, her finances are very stable, with a high wealth per capita, so she is in a position to finance the purchase of needed raw materials abroad.

Food.—Argentina is self-supporting in foodstuffs and, in addition, produces a large surplus of grain and animal products.

Industries and munitioning capacity.—As Argentina's industrial raw materials are confined to hides and wool, and as there is an absence of any mineral fuel, water power, or metals, she is entirely dependent upon foreign countries for manufactured products.

Foreign commerce.—Argentina's total trade for 1922 was over 1¼ billion dollars, 60 per cent of exports being agricultural products and 35 per cent meat products. Europe takes practically all the food products, while the United States takes surplus industrial raw materials such as linseeds, wool, and hides. Imports are chiefly manufactured articles of various descriptions, Great Britain and the United States leading, with Germany coming back strong.

Finance.—In general it may be said that Argentina's financial situation is excellent, being backed by a huge gold reserve. With the

exception of the United States and Great Britain, it is more stable than any country in the world.

Communications.—Argentina's railway communications focus in Buenos Aires. Her network of roads from Buenos Aires and Bahia Blanca is sufficient for her needs. Her strategic roads are the roads toward the Brazilian frontier and the Trans-Andean road. Highways are almost entirely unimproved. Telegraph lines connect all important points. Argentina stands first in South America in telegraph and railway mileage. Cables and radio connect her with the United States and other countries.

BRAZIL

Raw materials.—Brazil is essentially an agricultural country, its prosperity depending upon the export of nonmanufactured articles, although she undoubtedly possesses great undeveloped mineral resources. Material resources available for war include, in addition to such food products as coffee, cacao, sugar, cereals, and meat, industrial products as hides, rubber, cotton, and manganese ore. As a source of raw materials to the United States, Brazil is chiefly valuable for her production of coffee and, in addition, cacao, hides, rubber, and manganese ore.

Food.—Brazil is self-supporting in foodstuffs except wheat and flour, and this deficiency could be filled by substitution of corn, rice, and manioca flour. There is an enormous surplus of coffee, meats, and other foodstuffs.

Industries and munitioning capacity.—Although possessed of many raw materials necessary for peace or war-time industry, practically all war requirements except foodstuffs, must be imported. Raw materials available are cotton, rubber, manganese ore, and hides; but cotton textiles are the only manufactures of importance. Brazilian industry, however, is progressing rapidly.

Foreign commerce.—As Brazil is preeminently an agricultural country, the chief exports are coffee and other agricultural and pastoral products. Imports include flour, coal, and manufactured articles generally. In 1923 the total trade was $571,000,000, the United States leading, followed by Great Britain and Argentina.

Finance.—Although Brazil's immense resources make her financial situation fundamentally sound, her huge national debt and unskillful handling of her finances render her present condition very uncertain. In case of war of any magnitude, she would need foreign financial assistance.

Communications.—Brazil's railway communications are centered in the vital area from Minas Geraes south. There are a few short lines from other points on the coast inland. These are not connected

with the vital areas around Rio de Janeiro. The main line from Rio Janeiro to Montevideo and its connections are the strategic railways. Roads are generally poor and service being limited to the vicinity of larger cities.

Radio and telegraph lines connect all important cities and cable communication is maintained with the United States and countries adjoining Brazil.

The Amazon, while an important channel of communication in the rubber country, would not form a channel of invasion, as it does not lead to vital areas, and the control of its mouths is sufficient.

Summary.—From the foregoing discussion it is evident that the importance of Central and South America in the world's economy, lies in their production of raw materials. In considering their value to the United States as a source of raw materials, Central America may be dismissed at once as valueless, except perhaps for coffee. Colombia is useful for her coffee and platinum, Peru for its animal products, rubber, and vanadium, Bolivia for its tin, Chile for its nitrates, Argentina, Uruguay, and Paraguay for animal products, Brazil and Venezuela for coffee and rubber.

Practically all the countries considered are self-supporting or nearly so in food products, some of the more important ones having an enormous exportable surplus. These coutries may be considered as the world's reservoir of food supplies.

No country of Central or South America is economically self-sufficient; all produce raw materials and must import manufactured products. All of them lean heavily upon their foreign trade for their economic salvation and any interruption of that trade, whether by war or from any other cause, would soon spell disaster. Competition for this trade between the United States, Great Britain, and Germany promises to grow more intense as time goes on and therein lies the cause of probable friction in the future.

(IV) MILITARY SITUATION

Military systems.—The military system of each of the South and Central American Republics is based on compulsory service, both in peace and in war, with two exceptions. The exceptions are, Uruguay, which has voluntary service in its regular army, and Panama, which has no military forces, but depends on the United States to protect it. The laws of Uruguay provide for a National Guard, in which service is compulsory and which can be called out only in case of war. This force has not been organized. Argentina has had compulsory service since 1905 and the other countries for varying lengths of time; Guatemala only since 1921. In general these laws are not strictly enforced. Bolivia appears to be the best in this re-

spect. In that country the masses of the people are in sympathy with the law and few avoid service. In Chile the laws are enforced so far as registration is concerned, but the appropriations are too small to permit the entire class of men who reach military age in any year, to be trained, with the result that service in the active or regular army is practically voluntary. In most of the countries, conscription is by lot and even in the larger and stronger countries, like Argentina and Brazil, men of wealth or influence are able to evade service. In the smaller countries, conscription is confined, practically, to the lower and illiterate classes and often is accomplished by forcible impressment.

Periods of service.—The average length of service in the active armies is one year. In Argentina it varies from three to nine months. In Brazil it is from one to two years, until qualified. In Bolivia it is for two years and there are few reenlistments. In this respect Bolivia differs from the other countries, which have a considerable portion of enlisted men who remain in the service after the required period is served. Appropriations do not generally permit of training the reserves, to which the men pass after serving in the active army. Argentina and Chile require from two to four weeks' training during the reserve period, and Brazil has a large number of rifle clubs in which reserves obtain practice. Salvador, with a complete and interlocking service law, has a well-trained and disciplined reserve.

Mission of the organized forces.—As a rule the military forces of these countries are maintained for the purpose of preserving internal peace and order and are not organized or developed with the idea of meeting an external enemy. Argentina, Brazil, and Chile, with their rivalry for leadership in South American affairs, have to consider international relations in developing their forces, as do Peru and Bolivia, to a lesser extent, because of their boundary disputes. Salvador, a buffer state between countries prone to insurrections, must also consider other states in the development of its armed forces.

Military doctrine and principles of war.—Few of these countries have a well-defined doctrine or any principles of war. Practically all of them have now or have had foreign military missions to assist in the training of their military forces and have acquired some doctrines and principles from contact with those missions. Argentina, Chile, and Bolivia are essentially German in their training; Brazil, Peru, and Uruguay have had French missions. Against Peru and Bolivia, Chile would doubtless assume the offensive; against Argentina, Chile would first seek to defend the passes of the Andes; while concentrating a strategic reserve with which it might be able to strike later. Against a strong power, external to South America, guerrilla warfare

would quickly develop and opposition would be offered only near the centers of population, in any of the countries.

Organization.—Argentina, Brazil, and Chile, as well as most of the lesser countries, are divided into military zones, regions, or districts. In the principal countries, a skeleton division of the regular army is assigned to and stationed in one or more of these regions. In time of war it is planned that these divisions will be expanded to war strength by the addition of reserves living in the division's region. A typical peace-time division consists of two brigades of infantry, one brigade of artillery, a small regiment of division cavalry, one battalion of engineers, an observation battalion of the air service, communication and transport troops. Infantry regiments consist of two battalions of two companies and a machine-gun company or section. The artillery brigade usually consists of two regiments of two groups of two batteries of four guns each. Many of the smaller republics have the zone system, but their largest organized unit is no larger than a battalion in the United States Army. Nicaragua has no organized unit larger than a company.

Strength of the regular army and organized reserves.—These are shown in the following table, to which is added the strength of similar establishments in the United States, for the purpose of comparison:

Country	Regular army	Organized reserves	Country	Regular army	Organized reserves
Argentina	26,400	309,000	Honduras	2,900	43,000
Bolivia	7,100	30,000	Nicaragua	1,000	None.
Brazil	35,000	50,000	Paraguay	1,950	23,000
Chile	23,782	178,000	Peru	7,500	20,000
Colombia	6,000	27,700	Salvador	7,500	[1] 23,000
Costa Rica	500	None.	Uruguay	18,500	8,000
Ecuador	5,959	None.	Venezuela	8,000	22,000
Guatemala	5,800	62,000	United States	130,699	244,000

[1] Trained, not organized.

NOTE.—These approximate figures from Statistical Summary of November 10, 1923.

Armament.—The armament generally consists of Mauser 7.65-mm. rifles and carbines, models of 1898–1910; Krupp, Schneider, and Vickers mountain and field guns of 75-mm. caliber; Vickers and Madsen machine guns and automatic rifles. Argentina, Brazil, and Chile have heavier types of field guns, up to 105-mm. Peru has the heaviest seacoast guns on the Pacific side of South America in her Schneider-Canet 105-mm. and 152-mm. guns at Callao. The armament is generally old and in poor condition. Many of the countries, especially Brazil, are planning to replace its old matériel by French 105's, 120's, and 155 guns and 155 howitzers, but appropriations have not been made for this purpose.

Morale and efficiency.—Many of the inhabitants of these countries, with the possible exception of Argentina and Chile, are Indians (some of them, particularly in Brazil, Peru, Colombia, and Venezuela still uncivilized). In all countries there is a large class of meztisos, a mixture of Indian and Spanish or Portuguese. Neither of these classes make good soldiers as a rule. As a consequence the discipline consists in blindly following the leader to whom the soldier is attached. The morale and efficiency in the Chilean Army are rated as excellent; in Argentina and Bolivia, as very good; in Brazil, Salvador, and Peru as fair. Urugnay is rated good. The others, fair or poor. None of them, with the possible exception of Chile and Argentina, would fight a decisive battle in which severe losses were sustained.

Navy.—The navies of these republics are of less importance than their land forces. Argentina, Brazil, and Chile have each a navy consisting in general of two battleships, four or six cruisers, a few submarines, and some minor vessels. The navies of the smaller countries consist of a few gunboats, armed with light guns and machine guns only. Efficiency and morale generally poor. There is a naval mission from the United States now in Brazil and that country is making an effort to modernize its navy. Chile has a British naval mission; Peru, a mission from the United States.

Mobilization.—Argentina, Chile, Peru, and Salvador are the only countries which are known to have definite plans for mobilization. These in general consist of the expansion of the regular army to war strength by the addition of reserves from the first line or category and forming new units from the first and second lines of reserves. Equipment is lacking for these enlarged forces, except in Chile and because of the inadequate systems of communication, the character of the inhabitants and the lack of strong central governments, mobilization would be very slow, except in Argentina and Chile.

Potential man power.—The following table, taken from the Statistical Summary for November 10, 1923, gives the approximate population, man power, and per cent of man power to population of each country. The man power of the United States, taken from the same source, is added for comparison:

Country	Population	Total military man power	Man power in per cent of population
Argentina	8,698,516	785,000	9.0
Bolivia	2,520,000	237,000	9.4
Brazil	30,635,605	585,000	1.9
Chile	3,754,723	637,000	17.0
Colombia	6,303,077	369,000	5.8
Costa Rica	485,113	43,000	8.9
Ecuador	2,000,000	96,000	4.8
Guatemala	2,004,900	92,000	4.6
Honduras	637,114	46,000	7.3
Nicaragua	638,119	118,000	[1] 18.5
Paraguay	1,000,000	110,195	10.0
Peru	4,620,000	107,000	2.3
Salvador	1,501,000	177,000	12.0
Uruguay	1,429,585	176,000	12.3
Venezuela	2,363,097	105,000	4.4
United States	110,663,502	16,600,000	15.0

[1] It is evident that the above table is by no means accurate and it appears to be a combination of estimates made on many different countries by several different observers. The population of these countries can be nothing more than estimates in most cases and the percentage of man power to population involves many factors. Considering the fact that in the World War about 5 per cent of the population of the United States was under arms, it would appear that these figures include men needed for essential industries. Taking the figure of 15 per cent for the United States, it would appear that the above figures for Nicaragua and Chile are too high. A low percentage for Brazil, Peru, and Venezuela seems logical, because of the large number of uncivilized Indians in those countries. (See note at foot of this page.)

Rate of development of man power in war.—None of these countries has or can manufacture arms and equipment for its total man power. In considering the rate of development, therefore, it is assumed that arms and equipment can be obtained from other countries. It is certain that the development would be slow, because of the undeveloped condition of these countries. It is estimated that Chile could mobilize and equip 200,000 men in one month in an emergency requiring a maximum effort. An additional 50,000 could be mobilized by the end of the fourth month. Argentina could mobilize 200,000 in one month, 400,000 by the end of the second month, and 600,000 by the end of one year. Brazil could perhaps mobilize 120,000 by the end of one month and thereafter the increase would be very slow. Colombia would require at least one month for the first 20,000 and thereafter the development would be exceedingly slow. Guatemala could perhaps put 85,000 men under arms in case of need, but such a force would require approximately a year's time.

Conclusions.—From the viewpoint of organized forces and potential man power, the countries of Central and South America are not important to the United States as possible enemies. Their forces are comparatively weak, their equipment, training, morale, and efficiency are generally poor, and their facilities for manufacturing arms and equipment are negligible. It is only as possible allies of some foreign power and because of their geographical location that they are of military importance to this country.

NOTE.—The figures on man power given in table above, differ in several instances from the figures given on the man power of each country in Supplement IV to this report. The figures

given in the supplement are taken from the estimates on the different countries on file in the office of the Military Intelligence Division of the General Staff. Because both sets of figures are quoted it has not seemed desirable to attempt to adjust the differences. The most notable of these differences is in the case of Paraguay, in which there is a typographical error in the table given in the statistical summary and which has been changed from 10,000 plus to 110,000 in the foregoing table.

(IV.) CONCLUSIONS OF THE COMMITTEE

Except as allies of larger powers, the United States has nothing to fear from any or all of the Central and South American states. The chief danger to the United States is the blocking of the Panama Canal, thus separating the part of the United States Navy in the Pacific from the Atlantic Fleet.

Economically, the principal value of these states is in furnishing certain raw materials, such as rubber, nitrates, tin, and platinum, as well as foodstuffs, which supplement the supply available in the United States. As the world's available supply of oil nears exhaustion, the search for new fields and concessions may involve the United States in controversies with some of the great powers and lead to hostilities.

(V.) RECOMMENDATIONS

1. Every possible and proper means should be taken to maintain friendly relations with the countries of Central and South America. This should include the dispatch of military and naval missions to any country of Central and South America requesting them.

2. Plans should be made which will assure the United States an uninterrupted supply of certain raw materials from South America, both in peace and war, such as platinum from Colombia, nitrates and iodine from Chile, quebracho from Argentina, and rubber from Brazil and Venezuela. Plans should also be prepared for denying these and other necessary raw materials and foodstuffs to an enemy in time of war.

3. Plans should also be made to deny to an enemy possible bases along the Caribbean Sea and the Pacific Coast of South America from which the fleets and air services can operate against the Panama Canal.

GERMANY

THE PROBLEMS OF THE PACIFIC

1924

[Translated from the German press]

The habit of looking upon our western culture as the center of everything that is happening in the world makes it difficult at times

to form a clear judgment upon the ramifications of world politics. The loss of our colonies, which contributed toward clearer vision and gave us overseas connections with the sources from which the world powers derive their power, has aggravated the position as far as we are concerned. Distress and troubles of all kinds at home dwarfs the vision, and our public press finds it a very difficult matter to get independent unbiased foreign news. Enemy propaganda blurs the picture to-day just as much as it ever did during the war, and so it is not difficult to understand why so many German hopes for assistance from outside during the years since the war were vain and doomed to disappointment.

At the conclusion of the war several of the Great Powers transferred the greater part of their political activities from Europe to other spheres of interest, which during the turmoil in Europe had been somewhat neglected. Whereas hitherto the Mediterranean and the Atlantic Ocean and the territories belonging thereto were the principal regions in the struggle for political supremacy, in future the Pacific will be equally as important. There controversial matter is accumulating at a rapid rate, a process which was started in the beginning of the nineteenth century by the white race striving for expansion, leading to the first big outburst in the Russian-Japanese war at the beginning of the twentieth century. The world war has greatly accentuated the speed at which matters are coming to a head.

The main factors in this gigantic striving of the powers are the British Empire, the United States of America, and Russia. Certain minor but not altogether insignificant parts in the game are being played by France, the Netherlands, and Mexico. The Chinese Empire, so far, is nothing more than the scapegoat in this political conflict.

THE CHINESE EMPIRE

Although up to the middle of the nineteenth century China exercised sovereign rights in her own country, yet her abject weakness in a political sense at once showed itself the moment she came into contact with the European powers. Her advanced culture was not able to make up for lack of powers of defense.

The empire of a thousand years standing had to submit to aggression and interference with its territorial rights, such as is only imposed upon nations without any power or will of their own. When in 1911 party strife at home led to revolution, and the Manchu dynasty, really strangers in the land, was deposed, without anything equivalent being established in its place, the empire began to crumble to pieces and became more and more an object coveted by strangers. Nominally the central government continued to rule, but before long it had to share even its semblance of power with a southern Chinese government in Canton.

There has been no lack of attempts to reunite the Empire and to break the power of provincial governors and generals, but owing to internal dissentions they led to no permanent results. To-day China is more disrupted than ever. There are three main political combinations. The majority of the central provinces and part of the southern acknowledge, although in a somewhat loose fashion, allegiance to the central government. In the north General Chang-Tso-Lin, the Governor General, is master of the three Manchurian Provinces, although very much dependent upon the good will of Japan. In Canton Doctor Sun-Yat-Sen has established himself, supported by a few of the southern Provinces. With this division of such power as there is, it is obvious that China during the last hundred years, with her enormous treasures of all kinds, was bound to become the coveted object of the ambition of foreign powers.

The claims put forward by the powers concerned are the natural outcome of the historical development of the period in question.

THE BRITISH EMPIRE

The growth of Great Britain to a world-wide empire was achieved by development of her rule in the Middle and Far East. To this end England made use of the period following the French Revolution when the states of Europe were embroiled with each other. The first step was the final conquest of India. The never-resting commercial spirit of the English merchant, however, drove him further and further afield towards the East, up to the coasts of the Chinese Empire, the latter fighting against admission of the white man with all her strength. Pekin opened the gates of the country but slowly and only in submission to superior force. The first English acquisition was the island of Hongkong at the peace of Nanking in 1842, which closed the notorious opium war.

By means of this island England to this day holds the most important gate of entrance to south China, Canton, with all its wealth. The latter, also Amoy, Fuchow, Ningpo, and Shanghai, were opened to international traffic as so-called Treaty Ports. In order, however, to protect herself against competition on the part of other powers, England in the following year concluded a supplementary treaty to the Nanking Treaty relative to most-favorded nation treatment. According to this all advantages ever conceded by China to other nations should automatically be extended to England also.

By this means England created for herself in the Chinese Empire a privileged political and economic position, which to-day she is called upon to defend at the cost of considerable effort. The well-thought-out plans of permanent settlement of England in conjunction with other European powers were backed up by warlike expedi-

tions. Finally, after the surrender of the capital of China in 1860 the Pekin convention was concluded, forming the real foundation for the international opening up of China in the years following. For a time relations between the two powers developed apace in comparative quiet, until in 1876 the murder of an Englishman was used as an opportunity to enforce the opening of four new Treaty Ports on the Yangtse, and other advantages. This year is also noteworthy on account of the acquisition of the Malacca Peninsula with Singapore and the Straits Settlements, forming important stages on the road to eastern Asia and of particular importance to-day. Over and over again in the opening up of China we see the leading position occupied by England.

The more British interests, striving forward on the east coast of Asia towards the north, became consolidated the more they came into conflict with those of Russia and awakening Japan. The latter, after her successes in the war against China in 1894–95, appeared to be the most dangerous rival of the two. But it was soon recognized in London, that Japan might be turned into a useful instrument against Russia, the mortal enemy of England in Asia. Korea, Manchuria, and the Liautung Peninsula were natural objects of contention between the two. And so, after well-planned preparation, the first alliance with Japan became an accomplished fact on January 30, 1902. The treaty was aimed against Russia, but very cleverly excluded active cooperation on the part of England in the event of open conflict between Japan and Russia. British statesmanship actually succeeded in entangling the two rivals in a war in 1904. This certainly increased the power of Japan's position on the mainland of eastern Asia in a manner not quite to England's liking, but Russia had been bled to such an extent that her aspirations in eastern Asia, the Indian border states, and Persia were not quite so keen as before.

In 1905 the Anglo-Japanese alliance had been renewed in its original form, but in 1911 it was subjected to important modifications, introducing a form of policy towards Japan which is continued to this day. England withdrew the clauses distasteful to the United States. Political reasons affecting the position of the Dominions of Australia, New Zealand, and Canada were the moving forces, as the latter, in view of Japanese notions of expansion, considered their interests to be in this respect identical with those of the great North American republic. Another factor was that Japan, now advanced to the position of a great power, made no secret of laying claim to unlimited preeminence in eastern Asia and even constituted herself the champion of Pan-Asiatic ideas that would, sooner or later, imperil British ownership of India. From the point of view

of foreign policy, however, Downing Street had made up its mind that the first thing to be done was to arrange matters for a final decisive cleaning of the slate as regards Germany, and for that purpose it would be unwise to have Japan for an enemy.

The latter was fully aware of what that combination would mean for her own position as a power, and gave evidence of what was in her mind in her policy towards England. When, therefore, the British Empire became unduly entangled in the net of the European conflict in the World War Japan exacted a high price for her consent to China's participation in the war for the purpose of destroying German trade in the Far East. Not until the Allies admitted Japan's privileged position in China, and granted her the German possessions in Shantung and in the South Sea Islands north of the equator did Japan give her "consent" to China's declaration of war against Germany. When thereupon Japan consolidated her economic position on the east Asiatic mainland more and more, England was fighting in Europe for Japan's extension of territory.

The following table clearly shows how British imports into China declined owing to Japanese competition in the critical year 1917:

From	Imports in millions of gold marks				
	1905	1913	1917	1919	1920
Great Britain	264	297	156	192	396
Hongkong	444	516	474	462	477

Even the postwar improvement in the figures is more apparent than real, as a comparison with Japan's trade statistics in the following section shows.

JAPAN

The strongest rival of England in the Pacific to-day is Japan, as we have already mentioned. In like manner as the cradle of Prussian Germany stood on the poor soil of the Mark of Brandenburg, which bestowed upon Prussianism, not direct material benefits it is true, but all the more moral impulses to forge ahead and will do so again in future, so modern Japan has developed on her own poor native soil.

Only one-eighth part of the ancient Japanese islands of Kiuchiu, Shikoku, and Hondo is fit for profitable agriculture, whereas the remainder is poor hill country. In antagonism with this fact is the extraordinary fecundity of the people. In 1898 the population was 46.5 millions; to-day it is over 60 millions. Consequently the Japanese people were forced into industrial pursuits and overseas trade, and also to adopt ideas of political expansion. The latter were fostered

by the fact that the most essential of all prerequisites for the development of industry as understood to-day, namely, coal and iron, are not available to any extent in the native soil of Japan. To this must be added the extraordinary mental activity and alertness of the race, which European critics so often comprise in the hackneyed expression "instinct" for imitation. But only a nation of such unusual ability, uniformity of views, and native force like Japan is capable of achieving all the latter has achieved in the span of one brief half century.

After its so-called "restoration" the island empire found itself confronted with two tasks, if it desired to oppose effectually the white powers advancing upon eastern Asia. It was, in the first place, necessary to meet them armed with political and economic weapons of equal force and value. That meant an entire remodeling of the customs of the people in a European sense without entirely sacrificing their traditional national imponderabilities in so doing.

As every nation has just that particular government which it deserves, so in Japan in this critical period distinguished statesmen were found, such as Ito, Inouye, Yatsukata, and Yamagata, and the regeneration of the Japanese people was led and carried out in a statesmanlike, tactful manner. These men also understood how to accomplish the second vital task, namely, the extension of the empire's possessions in the north and in the south right to the mainland, thereby laying the foundation of the future sphere of interest on the continent of Asia. In 1874–1880 in exchange for Saghalin the Kuriles were acquired from Russia; in the south, consequent upon war with China, the Liukiu Islands, and above all Formosa. The next step was naturally to secure profitable territory on the mainland. The natural bridge across the gulf, as it were, was the Peninsula of Korea, which embraced the Chinese vassal state of the same name. The penultimate goal was, however, to be in a position to exploit the fertile territory of Manchuria, rich in coal and iron, and Central China. That led to two wars. The first, against China, ending in the peace of Shimonoseki on April 17, 1895, brought Japan, among other things, the severance of Korea from China, a formal declaration of the independence of the former and its de facto incorporation with Japan.

The Liautung Peninsula Japan had to let go in compliance with objections raised by Russia and her ally France, also Germany, who thought herself called upon to champion European interests. That aggravated the position between Japan and Russia exceedingly and provided the excuse for the appeal to arms of both powers 10 years later. And 10 years after that Japan took her revenge upon Germany for Shimonoseki by depriving her of her flourishing colony in eastern Asia.

Japan, having now secured a new base in China, laid herself out for a supreme effort in her attempt to bring the Celestial Empire under her political and economic guardianship altogether. Her demands, which Pekin was compelled to comply with, are comprised in the well-known 15 points of the year 1915.

The great powers of Europe were entangled in the meshes of the war and not in a position to prevent these restrictions upon their influence in the Far East.

The importance of Japan's present-day position in Eastern Asia is due to the outcome of the war against Russia, which made Japan a great power. It is now once more the starting point for settling up with Soviet Russia.

1. Japan received Korea.

2. Japan took the place of Russia at Port Arthur and Dalny (Daria).

3. Russia evacuated Manchuria, which was to be opened to international trade. The administration of the Manchurian Railway was divided between Japan and Russia, the latter being given the portion north of Kwang-chensi, and Japan receiving the southern portion.

4. The southern portion of the island of Saghalin up to the 50 latitude was given back to Japan.

5. The fishing rights of Japan in the territorial waters of the mainland were to form the subject of a special settlement.

At the end of the World War, however, Japan found herself in a peculiar position. The guarantor of the peace of Portsmouth of 1905, czaristic Russia, had disappeared. Japan's refusal to recognize Soviet Russia was answered by Moscow with the cancellation of the peace of Portsmouth and of pre-war debts.

Economically, however, Japan was filled to repletion. She had made good use of the World War, to establish herself in all the old commercial fields of America and the European States, and, above all, to gain a firm footing in China, as is shown in the following table:

Countries	Imports in millions of gold marks		Countries	Exports in millions of gold marks	
	1920	1913		1920	1913
Total	4,906	1,532	Total	4,092	1,328
Including from:			Including to:		
Great Britain	494	244	United States of America	1,187	354
British India	829	283	China	862	241
United States of America	1,834	267	France	151	92
China	458	115	Great Britain	205	63
Germany	25	128	Germany	2	28

The figures of Japan's total imports from the various countries are a clue to the growth of her industry during the world war, just as the figures of the exports of said countries to Japan are a clue to the latter's buying capacity—in other words, her financial strength. Apart from China, the Japanese export figures to Great Britain, British India, and the United States deserve special attention.

They illustrate, probably much more clearly than an investigation of political actions would, where the motives for the problems of the Pacific are to be sought.

RUSSIA

In eastern Asia some time last summer a political act was performed the real significance of which does not appear to have been grasped or troubled about by the public. This act was the reentrance of Russia into the circle of "Pacific" powers. With this act the greatest (in extent) homogeneous empire in the world once more begins to formulate demands, the reasons for which are to be sought deep down in the foundation of its historical development.

In the early struggles with Mongolians and Tartars, from the thirteenth to the fifteenth century, the Moscovitic rule of the grand dukes was founded. At the end of the sixteenth century consequently a great part of Siberia fell into Russian hands. But it was the opening up of China in the second half of last century that incited Russian aspirations in the direction of the East, and which in 1860 led to the acquisition of the territory along the coast and to the foundation of Vladivostok and Nicolajewsk.

At the end of the century Russian power in the Far East was at the zenith of its growth, evidenced by the influence exercised by the Czar at Pekin. That upset Japan, and England more so. The consequence was the war against Japan 1904-5. Russia was compelled to share her position with Japan, but China had to foot the bill. The division of the administration of the railways in Manchuria simply meant, that North Manchuria became a Russian sphere of interests, and South Manchuria a Japanese sphere. The loss of the Liautung peninsula with the ice-free ports of Port Arthur and Dalny (Daria) was a painful subject for Russia, but the Cross of St. Andrew continued to float in the breeze at Vladivostok.

If the Russian-Japanese war was a remarkable stroke of British statesmanship, the embroiling of Russia in the World War was a masterpiece.

The defeat of Russia brought the revolutions of the Menshiviki and later on of the Bolsheviks in its train. The Russian empire was weakened tremendously and in fact seemed to be falling to pieces into its component parts. Pressure against India seemed to be re-

laxing. Far away in Siberia a new weakling state was formed, the Soviet Republic of the Far East. This state of matters lasted from 1917 up to about 1922. Meanwhile England discovered to her sorrow, that in the place of threatening construction of railways on the frontier of India she was confronted with the poison of bolshevik propaganda. It was this propaganda before which finally the Japanese troops evacuated the mainland. And at the negotiations with Japan last summer in Changchun, instead of Chita, it was once more Moscow which had constituted itself the spokesman of Russian interests in the Far East.

THE UNITED STATES OF AMERICA

Whereas so far the quarrels between the Powers had in the main centered around the question of acquiring proprietary rights in the impotent Chinese Empire, the problems of eastern Asia assumed far greater proportions when the United States began to interest themselves in the problems of the Pacific.

The introduction, as it were, to this phase was the race in the middle of last century between the white and yellow races for the possession of the west coast of North America. With the completion of the great Union Pacific Railroad from New York via Chicago to San Francisco in 1869 the final victory was with the white race, nor were all Japan's efforts in the beginning of this century to divert some of her surplus population to the Western States of the Union able to alter anything in this fact. The stubborn resistance of the Americans against these immigration ideas led to the verge of war, but both antagonists shrunk for the time being from bringing matters to a head. The result was that a formula was agreed upon, intended not to offend the susceptibilities of Japan, at the same time virtually meaning the exclusion of Japanese immigration from the United States.

But even the Americans had not contented themselves with political defensive action only. As far back as 1867 they had acquired from Russian Alaska and the Aleutian Islands, the latter extending close up to the mainland of eastern Asia, and in 1903 and 1904 they established coaling stations on Unalaska and Kiska. In 1907 the Hawaiian group, densely settled with Japanese, the latter accounting for 50 per cent of the population, was annexed to the territory of the United States. When the *Maine* blew up in the harbor of Havana on February 15, 1898, it was an excuse for President McKinley, after a few skirmishes with the Spaniards, to launch out upon further acquisition of territory. Being master of the port of Havana, a demand was made to surrender the Philippines, and as regards the Spanish Mariana Islands the United States kept the

important station of Guam on the road thereto. When England in the following year retired from the Samoa group in favor of Germany, America insisted upon retaining for herself the best harbor of all, Pago Pago, on the island of Tutuila. Thus, much in the same way as England had built up for herself a safe sea route through the Mediterranean via India, the Straits Settlements, Hongkong to eastern Asia, America had provided herself with a route across the expanse of the Pacific Ocean.

Home and foreign politics have, however, in one way and another never let the United States get much joy out of their ownership of the Philippines. If even the Spaniards had to suffer from interminable guerrilla wars, the unrest in the country under American rule at times assumed very serious proportions. In addition to regulars, at times as many as 25 American volunteer regiments were fighting the natives without, however, achieving anything definite.

The "independence" demanded by the Filipinos was finally granted in 1907 to the extent of constituting a National Assembly, but so far the question is as unsettled as ever it was. The Philippine question seems to have become the daily regular fare in American politics, and there has been no lack of advocates in favor of letting the islands go and thereby removing this stumblingblock.

Another thorn in the flesh was the constant dread that in case of a war with Japan the Philippines might easily fall into the hands of the enemy long before the Union would be in a position to dispatch sufficiently strong forces in their defense. Lately Washington has given signs that it would welcome a modus vivendi, which would preserve for the United States the prestige and the advantages of possession, making the maintenance of the independence of the archipelago—to spite Japan—an international affair.

THE OTHER POWERS

The French were eager supporters of England in the opening up of China, but before long France started out to secure property there on her own account. The object in view was the acquisition of that Chinese dependency, the Kingdom of Annam in Indo-China. After a few failures Napoleon III, in 1862, proclaimed the southern portion of Annam, Cochin China, a French republic. A commercial treaty, extorted in 1874, finally brought the whole of Annam under French rule, and French commercial expeditions penetrated right through to the Yang-tse-Kiang.

But it took another 12 years before official China agreed to it all.

When at the turn of the century Germany took possession of Kiao-Chou and England of Wei-hai-wei, France acquired the port of Kwang-chou-wan, southwest of Hongkong.

Before the World War extensive plans were in preparation at the French colonial office with a view to turning the colonial possessions in eastern Asia into a kind of French India. The lack of a powerful fleet was no doubt the main stumblingblock. To make up for that disappointment it has now been decided to build up and develop the African colonial empire, nicely rounded off and compact, by the annexation of the flourishing German colony of the Cameroons and half of Togoland; this is to be carried out on a big scale and to be closely connected with the motherland.

As affecting the Pacific question, the colonial possessions of the Netherlands are more important still than those of France. The rich island world of the Dutch East Indies is the valuable remnant of a one-time great colonial empire, dating from the time when the Netherlands were the leading sea power of the world. Dutch East Indian possessions are to-day closely bound up with the prosperity of the motherland. They are to the homeland something akin to what British India is to the United Kingdom. After the Russian-Japanese war especially there were plenty of people in Japan who were in favor of robbing the Dutch of their colonies. Japanese agents and immigrants turned their steps in this direction when they were turned away in Australia and New Zealand just as sharply as they were in the United States.

In spite of all loving care, the World War has severed many economic ties between the homeland and the colonies in the Indies. Imports from Holland, which in 1913 amounted to 898 million gold marks, had dwindled to only 219 millions in 1921.

We must not forget to mention Mexico as a possible factor in the development of the Pacific problem, as that country once seemed to be predestined to play a certain not altogether insignificant part. That was in the years 1907 to 1913, when the waves of indignation were running high in Japan on account of the Union having barred Japanese immigration, and when the people were seriously discussing the possibility of a war. Then all eyes were directed towards Mexico, which looked upon the United States as her natural enemy. In 1845 after an unfortunate war Texas was lost and Mexico was convinced that further ideas of expansion on the part of the Union would overrun the country on their way to the Panama Canal.

POSTWAR POLICY

Four years of most intense and concentrated effort on the part of the great European Powers have, as we have seen, also rearranged conditions and power in the Pacific.

In London the intoxication of Versailles was soon dissipated. In exchange for the joy of smashing up German trade and German

sea power other much more weighty cares were making themselves felt. England had ceased to be an "island": across the channel both on land and in the air a super-powerful neighbor had arisen, and that neighbor's striving for the hegemony was disturbing the balance of the political scales. Her dreams of a gigantic colonial empire closely united to the motherland ran right across the British sea route in the Mediterranean to India and the Far East. Instead of the Germans, who had been crushed, the new commercial fleets, built during the war, of the United States and Japan entered into competition with those of Great Britain, supported by largely augmented naval forces.

In Egypt and India there were rumblings and mutterings about President Wilson's dictum on self-determination, and even home possessions of Great Britain were affected and infected by Irish liberation movements. The claims put forward by the Dominions, strong and self-confident by virtue of the military aid rendered by them to Europe in her time of need, made people at the head of affairs in London stop and ponder.

In order to reconstitute the unity of the world-wide Empire the first step was the Empire Conference, convened in London in June, 1921, to which the Prime Ministers of the Dominions were invited. The underlying idea was that it would be good policy, if possible, to distribute the cost of imperial defense, which hitherto the motherland had almost entirely borne herself, over all the Dominions, thereby emphasizing the idea of imperial unity.

But pre-war history once again repeated itself, and the British Prime Minister failed to arouse his overseas colleagues to any particular degree of enthusiasm for the scheme. The Dominions expressed the significant view that the Empire was not likely to be attacked yet awhile, so the right thing to do was to reduce expenses for armaments to a minimum. Without saying too much about it, reliance was placed, in the event of danger threatening, upon the Royal Navy, and that was being paid for by the British taxpayer. No agreement could be arrived at on this point, so important for the cohesion of the British Empire. Still more delicate and critical were the negotiations—mostly carried on behind closed doors—relative to a renewal of the Anglo-Japanese alliance.

This treaty had already been modified in several important points in 1911. Above all, as we have already seen, active cooperation of England against the United States was excluded. But this formal amendment did not satisfy especially Australia and New Zealand, who felt themselves threatened by Japan. Canada also had let it be known tht she could never take up arms against the Union, to whom she was closely united by a common political frontier and

economic ties. When the imperial conference had reached a critical point in its deliberations, America's invitation to a conference at Washington on the problems of the Pacific Ocean and on disarmament arrived most opportunely. The meeting was to take place in November. There are fairly clear indications that the originators of this conference plan are to be sought and found in London. In addition to England the United States, too, deemed it urgently necessary to get matters straightened out and a clear understanding on these new problems of the Pacific, neglected through the war.

The picture presented by the conference gave an interesting insight into the new constellation of what may be termed "the Pacific Powers." Whereas, on the one hand, the efforts of the two Anglo-Saxon powers, now that the war was over, tended toward an early resumption of business activities, on the other side of the conference table we find seated France and Japan, who, supported by their newly acquired position of power, were inclined to doubt the possibility of peace lasting for any length of time. There were, therefore, two important tasks to accomplish—in the first place to prune down the influence acquired by Japan in China during the war, in order to give British and American trade a chance to spread itself once more; and secondly to tone down competition in armaments, in which the United States were quite as much engaged as Japan and France.

Although at times during the course of the conference success seemed doubtful, yet the object aimed at was finally attained in the main in a series of agreements. Of course, it soon became evident, that general disarmament was out of the question. In fact not even a strict limitation of the strength of fleets was possible in the face of France's opposition. So finally the conference contented itself with fixing a ratio of power in respect to dreadnaughts in the following proportion: England, United States, Japan, France=5–5–3, 1.75.

Allowing for existing units the figures therefore work out as follows:

Country	Battle-ships	Battle-cruisers	Armoured cruisers
England	20	4	12
America	18		12
Japan	12	4	9
France	9	6	4

In looking at the above list we must not overlook the fact, that although England evinced sufficient political sagacity to forego, in form at any rate, her previous naval supremacy, and to recognize

a one-power standard at sea against the United States, yet as a matter of actual fact the British fleet even now is superior to all the rest by virtue of her battle cruisers alone.

Neither America nor Japan, for instance, have at their disposal such a fighting unit as the battle cruiser *Hood* with her 42,000 tons. Furthermore England possesses 49 protected cruisers of the latest type; the United States 13 only, and 10 of these are antiquated.

Of equal importance, at the very least, with this agreement relative to limitation of naval armaments is the four-power convention relative to the Pacific Ocean, signed at the conference on December 13, 1921.

In this convention America, England, Japan, and France mutually guarantee to each other their possessions in the Pacific. That robbed the Anglo-Japanese alliance of 20 years' standing of its object, and it has not been renewed, much to the satisfaction of the United States and the Dominions in the Pacific. That fact produced somewhat mixed feelings in London. The inner cohesion of the British Expire and the endeavor to walk hand in hand with America in future decided the matter, however. In Tokio, on the other hand, we find a dejected mood and no attempts to hide it.

In this convention of December 13, 1921, there is an important article, No. XIX, in which a prohibited zone is established, within which no new fortifications may be constructed. Article XIX reads as follows:

> The United States of America, the British Empire, and Japan agree, that the status quo, at the time of signing of this agreement relative to fortifications and naval bases, in their following exactly prescribed territories and possessions shall be maintained:
>
> 1. On the insular possession belonging to the United States at this present time or which may in future be acquired by them in the Pacific Ocean, excepting (*a*) on those extending in front of the coast of the United States, Alaska, and the Panama zone, exclusive of the Aleutian Islands, and (*b*) on the Hawaiian Islands.
>
> 2. On Hongkong and the insular possessions belonging to the British Empire at this present time or which may in future be acquired by the same in the Pacific Ocean East of the 110 degree east longitude, excepting, (*a*) on those extending in front of the coast of Canada, (*b*) on the Australian Confederated States and their territories, and (*c*) on New Zealand.
>
> 3. On the following insular territories and possessions of Japan in the Pacific Ocean, namely, the Kuriles, the Bonin Islands, Amami-Oshima, the Linkiu Islands, Formosa, the Pescadores, and other insular territories or possesions in the Pacific Ocean, which Japan may acquire in future.

The maintainance of the status quo subject to the aforementioned reservations implies, that no new fortifications or navel bases may be built in the specified territories or possessions; that no arrangements may be made for the increase of existing facilities for the

repair of ships or the maintenance of the naval forces: and that no extensions of the coastal defenses of the above specified territories or possessions may be made. This limitation, however, does not exclude repairs and renewals of worn-out arms and accouterments, such as are generally required and used in peace times for the equipment of the army and navy.

Thus a wide zone was established, the prime object of which was to prevent Japan from developing, in a military sense, her island empire, which had been extended considerably by the acquisition of German property, by establishing as it were, a vast advanced outpost in front of her native islands and so controlling the most important sea rontes in the Pacific. On the other hand this article XIX is to be regarded as a great concession by the Union to Japan, by foregoing her right to extension of the fortifications on the Philippines.

In Tokio, however, having an inkling of the conference plan on foot in Washington, the authorities had taken time by the forelock, and ever since the spring of 1921 with all available resources and working night and day had done everything humanly possible to fortify the Bonin Islands. It is an open question whether it was a case of carrying out previously prepared, well-matured plans, or whether the American newspapers are correct when they described the work as wilful sabotage of the intended disarmament plans.

After these by nò means negligible results of the Washington Conference one might have thought that the rival powers of the Pacific would now devote themselves wholly and entirely to their peaceful business occupations. But that was not the case by any means. Over and over again one reads in English and American newspapers that on all sides the good faith of the others is doubted.

The Americans, for instance, assert that the big guns of the British fleet have a greater elevation, so as to be able to fire at longer ranges, and that this was contrary to the Washington convention. The English, on the other hand, are worried with doubts whether the Americans are really breaking up the ships struck off the list according to agreement.

The Japanese are accused of undue augmentation of their fleet of cruisers and airplanes. And although all these reproaches may not be justified by any facts whatever, yet they are evidence of the mistrust, the suspicion which after all is only the outcome of the opposing vital interests of the nations involved.

There are two other specially important agreements, the outcome of the Washington Conference, namely, the agreements concerning the settlement of affairs in China—specially important not so much on account of their holding out any prospects of producing

law and order in the Celestial Empire (probably not one of the great Powers troubles very much about that) but specially important because they are attempts to crowd out the Japanese rival from his predominant position in China.

One of these agreements is that of the "open door" and other Chinese questions, and the other is an agreement extorted by the leading powers, the Japanese-Chinese "evacuation of Shantung" agreement. The latter, strange to say, constitutes an absolute redrafting of articles 156 to 158 of the Versailles treaty, as the latter stipulated that German property in Shantung should be transferred to Japan. Now Japan was to clear out of Shantung and Tsingtau within 6 months at the latest.

Thus we see again and again how England and America are of one mind against Japan, in order to confine the latter's privileged position in eastern Asia, acquired during the war, within as narrow limits as possible.

From this isolated position the Japanese Government drew the consequences. A semiofficial communication from Tokio, for instance, stated laconically that shortly after the close of the Washington Conference the marshals and admirals had met in order to discuss the necessary measures in connection with Japan's new position.

Very shortly afterwards, therefore, the authorities in Tokio tried to straighten out the matters in dispute with the Soviet Republic of the Far East. First of all, the intention of Japan was to retain her troops in the maritime provinces, to acquire her fishery privileges on the Amur and the coast, which had been previously promised to her, and the razing of the Russian coastal defenses, especially those at Vladivostok.

In the summer of 1922 negotiations took place on these subjects with Chita at Dairia, but with no result. As meanwhile bolshevistic propaganda began to undermine the discipline of the Japanese troops, and the remnant of the forces of the White Guards in and around Vladivostok sustained one defeat after another, the Japanese withdrew from the mainland but kept the northern portion of Saghalin, belonging to Russia, as a pledge.

The negotiations at Changchun at the beginning of 1923 and recently at Tokio also led to nonresult. On both occasions, strange to say, not Chita but Moscow appeared as spokesman for Russian interests in the Far East. In so doing Soviet Russia continued a policy of the czaristic government, which is one of the most vital policies affecting the existence of the country, namely, the policy of securing access to the open sea in the East also.

London likewise had no illusions as to the consequences of the reappearance of Russia in Pacific affairs. This fact was all the more

disagreeable because of the constantly increasing differences with Russia with respect to the latter's carefully planned bolshevistic propaganda in the British sphere of interest in Persia and the Indian border states. When this developed into active interference with British subjects, it was decided to bring matters to a head with Moscow. The latter was threatened with the cancellation of the trading agreement made by Lloyd George, which the Soviet government looked upon as the first step towards de jure official recognition. Consequently the Russians gave in on practically all points, but not as regards withdrawal of its representatives at Cabul and Teheran, whom Great Britain accused of conducting bolshevistic propaganda in British spheres of interest. That ended the matter for the time being, but doubtless the "feelers" on both sides for weak spots in the political armour have given the statesmen of both sides valuable hints for the future.

All that remains for us now is to inquire into the measures which we may term military political preparations for the future handling of the problems of the Pacific.

We have seen that one of the results of the Washington Conference was the establishment of a "prohibited" zone, within the limits of which no extension of existing fortifications is permitted.

Now, it is most interesting to note that this enormous, in a certain sense, "neutral" zone is not by any means looked upon as a guarantee for the security of their own coasts by the Powers concerned.

On the contrary, in the spring of 1923 the United States started the procession of a series of fortification plans. Maneuvers of the fleet off the west entrance of the Panama Canal were to be the means of proving that the fortifications there were utterly inadequate, especially in the event of an attack by a naval power against the Canal with air forces from the Galapagos islands, belonging to the Republic of Ecuador. Mr. Hughes, the United States Secretary of State, goes further still in his speech on the Monroe doctrine on August 30, delivered to the American Bar Association, in which he stated that the United States could not allow any other Power to have control over the Panama Canal, including the eastern and western entrances thereto. Moreover, provision must also be made for the probability that in the near future the government would come forward with plans for a second Atlantic-Pacific Canal to provide the security the country needed.

Another noteworthy point is the extensive plan for the strengthening of the naval bases now being worked out by the United States Navy Department. This plan provides for a period of 20 years, during which $155,486,000 are to be expended on fortifications. Special provision is made for the west coast and for Hawaii. But the

fortifications of Cavite in the Philippines, on Guam, and Samoa are to be "brought up to date."

While both Houses of Parliament in London were still debating the question of developing the air forces on a big scale, the British Government in May last put forward the plan of the Singapore base for the fleet, which was to be a base of the first rank. This idea is a typical instance of British policy, which "thinks in continents," whereas France is anxiously defending a position of power out of all proportion to her decreasing population and her people devoted to a long-established habit of retiring into private life as soon as they have a small competency derived from investments, etc.

The "Singapore policy" is creating quite a stir both at home in England and abroad. Repeated debates in the House of Lords and the Commons dealt with this subject. Replying to a question by Viscount Wimborne in the House of Lords, whether, in view of the financial position of the country, the heavy expenditure for the air service should not have precedence over the expenditure necessary for Singapore, Lord Salisbury stated significantly:

The government is responsible not only for the British Isles but also for the daughter States in every part of the world, not least in the Far East. With respect to the new naval base the government is thinking of the future. However friendly the position with one's neighbor in that part of the world may be at present, it is unreasonable to assume that for that reason the government, as the guardian of the safety of the Empire, should take it for granted that we shall permanently remain on a friendly footing with everybody.

If there was any doubt as to whose friendship in the Far East could not be relied upon in the long run, English newspaper polemics dispersed that doubt unequivocally in their discussions about Singapore.

Very shortly afterwards the Japanese Minister for Foreign Affairs, Count Uchida, expressed himself to newspaper interviewers as follows:

Japan has no understanding with England on the Singapore question. The plan can be justified by the expiration of the Anglo-Japanese alliance. In many respects it is opposed to the spirit of the Washington Agreement. But that is an internal affair of England's, therefore Japan has no right to say anything. There is nothing in Anglo-Japanese relations which make such a far-reaching plan necessary.

But Japan, too, has this year appropriated 10,000,000 yen (1 yen = 2.09 gold marks) for extension of naval ports and dockyards.

Quite as much of a surprise as the Singapore plan, was the demand put forward by the Netherlands Government for expediting the fleet-building program of last year, in view of the possibility of a future war between adjacent states. The Netherlands East Indies is to be provided with a fleet of 4 cruisers, 24 destroyers, 32 sub-

marines, 9 mine layers, several auxiliary vessels, and 108 airplanes. In addition 184,685,000 florins (1 florin=1.69 gold marks) have been appropriated for fortifications in those colonies, spread over 6 years.

Dutch naval experts are of opinion that the naval forces projected would hardly be able to hold their own for any length of time, but it is believed that assistance would soon be rendered by some other power.

In reference to these questions the English "Foreign Affairs" in their September issue ironically and very significantly remark, as Downing Street denies having anything to do with these Netherlands plans:

"But there have been no discussions! Very odd! Then these Dutch loans, £5,000,000 issued in London last January, £6,000,000 last June. No discussions! Very odd! Who is it that is running this Singapore scheme and what is the game?"

REVIEW

We were able to discuss the positions of the Pacific powers in their historical development and the consequent post-war policies in broad outlines only.

The future in that part of the world is fraught with innumerable possibilities. In the main, however, the policy of to-morrow is bound up, very closely bound up, with the vital needs of the several nations involved, and they move but slowly. We should like to distinguish between two leading all-overpowering questions in this problem of the Pacific. The first is the Chinese question, embracing everything in connection with the Chinese Empire as an object of political intrigue. The second is the Japanese question, comprising everything consequent upon, connected with the natural striving for expansion of the Japanese people.

Whereas the first is more of a local question, an East-Asiatic home problem, the second touches the whole range of Pacific Ocean politics.

In speaking about China we wish to be understood as referring only to China proper, exclusive of the border territories of Mongolia, Turkestan, and Tibet, which occupy a special position of their own. Future developments in the Chinese question will largely depend upon future developments in the constitution of the Empire. People are very prone to look upon the signs of disintegration of the Empire as foreboding the final collapse. But if we glance at the hoary history of this ancient country we frequently come across similar intervals of weakness. They are only natural in such a gigantic mass of humanity, numbering to-day over 400 million souls, a mass which could not possibly be welded into one homogeneous whole by

building up the Chinese wall around it. In this big nation there are, as a matter of course, widely divergent political, economic, and social movements surging to and fro, and equally as a matter of course at times they clash and crash into one another, and confusion is the result. Whereas the northern provinces have a climate something like that of Scandinavia, the southern provinces have a climate similar to that of the countries on the shores of the Mediterranean. Consequently culture, temperament, yes, even language, differ greatly between the two, with the various sections of various races inhabiting them. Then, again, what may be termed a superfine, supersensitive culture and long periods of peace rendered the people susceptible to pacifist ideas. It therefore had little respect for defensive measures and so lost its political self-determination. How firmly, notwithstanding this fact, the national homogeneity is welded together is brought home to us when we see that Moscow's bolshevistic propaganda, something entirely foreign to the people, in spite of almost superhuman efforts has so far been able to make practically no impression whatever upon the mass of the Chinese people, an admission which the Soviet delegate, Mr. Joffe, was compelled to make at his meeting with Dr. Sun-Yat-Sen at Shanghai in January last.

Careful observation of events since the revolution of 1911 tends to show that China, although at a much slower pace, is passing through a period and process of reformation such as Japan, a much smaller island empire, passed through in rather less than half a century. In the same way the political aspect of China will change once the thousands of students of every kind who are sent to Europe and America every year have returned home and grown up as the leading "upper circles" of the nation. There are already several noteworthy instances on record that the movement has started, in connection with several occasions of boycotting of Japanese goods during the last few years, when students were active as originators and organizers—milestones, maybe, on the road to regeneration of the Empire.

But there are other outside forces also, active and intent upon reaping advantages from dissentions at home in China. Probably it is Japan who stands at the head of all. It is, as a matter of fact, a vital necessity for the Japanese nation to secure for itself on the mainland the agricultural produce and mineral supplies which it needs for its development, maybe for its very existence itself, and which it has not got at home. The country's position as a "Power" depends upon that. A glance at the map will tell us that it is not merely a question of the ownership of Korea and South Manchuria, but a question of the entire west coast of the Japanese Ocean, includ-

ing, that is to say, those portions of Eastern Siberia which she has just had to evacuate. Japan in any case looks upon the whole of China as a natural field for trading enterprise. In these facts lie an enormous amount of explosive matter for the future. Furthermore, the natural mutual antagonism of the Russian and Chinese Empires against England will under certain conditions lead to the latter making common cause with Japan.

There are, however, deep-seated differences between Russia and China also, the main reasons for which are the occupation of eastern Turkestan, parts of Mongolia, and north Manchuria, deeply affecting the sovereign rights of Pekin. Negotiations between the two States, relative to the evacuation of Mongolia ended in nothing, as was to be expected. As the Russian colossus for centuries past has been forging ahead towards an ocean free from ice, so one of these days it will once more voice its claims to Korea and the Liautung Peninsula.

The other two powers struggling for influence in China are France and the United States. Whereas the former is above all things concerned with the preservation of her old-established markets in central and southern China, the United States, like Japan, have become keen competitors of the British trader. On the other hand, Japan is the mutual antagonist of both Anglo-Saxon powers, who scent danger ahead for their Pacific possessions, including India.

That brings us to the second, the Japanese question.

From the outcome of the Washington Conference in 1921-22 Japan, with admirable self-restraint, has drawn her own conclusions. She withdrew her garrisons from central China, evacuated, although under compulsion, the Siberian coastal territories, and entered into negotiations with Moscow. But as Japan in 1894 took the initiative in the war against China and in the campaign against Russia in 1904, so she will in the future also not hesitate to hew out new roads for the expansion of her surplus population. In addition to British, American, and Russian possessions, the Netherlands East Indies will be endangered by that movement, the future political position of the latter colonies being hardly open to doubt.

In like manner as every political question in the long run becomes a matter of military policy, so also the problems of the Pacific, in fact rather more so. The all-important factor here is distance, which is very great for all concerned. So every conflict will, in the main, be a naval conflict.

Japan, naturally, has bestirred herself betimes, and built high-speed warships capable of a wide radius of action. On the other hand the English periodical, the Naval and Military Record, in its

issue of January 31, 1923, writes very significantly with respect to the British fleet:

The majority of our light cruisers of the C and D classes are war-time built, intended for the North Sea and obviously hardly suitable for work in the Pacific. For operations in the Pacific Ocean we can only rely on the *Hawkins* and *Emerald* cruisers. Therefore it is urgently necessary to prepare a new program for the building of ocean cruisers. Notwithstanding the disappearance of the German fleet and the limitation of foreign battleships construction by the Washington agreement, the sea power of the British Empire in the Pacific Ocean has diminished. That is partly due to the temporary increase of the Japanese fleet, and partly to the great reduction of the British fleet at home and in the Dominions. Thus, for instance, the Australian fleet has dwindled down to a single squadron of coast-guard ships.

Whereas Japan has long since adapted her fleet to the requirements of her home ports and to the bases of the colonies most closely in touch with each home port, America and England, as we have seen, are engaged in bringing their naval bases up to date. Up to the end of the war the bulk of American bases was on the Atlantic front. The building program now being prepared transfers the center of activities to the Pacific. In addition to fortifications and harbor works on the west coast the principal job on hand is the extension on a big scale of the defenses of the Hawaiian Islands. Maj. Charles H. White, in the June issue of the American Infantry Journal discusses at length the importance of Hawaii. He says inter alia:

Taking into consideration, in the first place, the importance of Hawaii as a defensive position, and assuming that our fleet has been repulsed, then Oahu acquires the status of an advanced post of continental America. On the other hand, no enemy would dare to attack us without first putting Oahu out of action. Otherwise his extended vulnerable communications would easily be interrupted by our submarines, destroyers, and air forces, which are based upon Pearl Harbor. To reduce Oahu, however, would require such an expenditure of strength and time that mobilization at home would be assured and the equipment of a relieving expedition would be completed. On the other hand, the Hawaiian Islands are needed as a supply station for the renewal of fuel and for repairs in operations against our west coast.

The limit of the radius of action of battle fleets is about 2,000 knots. Corresponding to the importance of Hawaii, a division of the American Regular Army, about the sixth part of the standing Army, is permanently stationed there for the defense of the country.

Nor must we underrate the importance of the Hawaiian Islands for offensive operations. In operations in east Asiatic waters they reduce the rear line of communications of the American fleet by nearly one-third.

In eastern Asia Formosa, with its fortifications, is the most important center for Japanese operations against British Hongkong and the American Philippines. It is only about 500 knots distant

from either of them. Both come under Article XIX of the Washington Pacific agreement, already referred to. It is therefore easy to understand why England now wants to develop Singapore as a naval base, as until this is accomplished there is not much chance of protecting Hongkong, 1,440 knots away. Not until this is accomplished can there be any strengthening worth talking about of the Australian-Netherland-British front in the southwest of the Pacific. Moreover, it would block Japan's principal sea route to India. The British fleet would then be provided with a base such as the Russians sorely regretted not having at Tchuchima.

What the political constellation in the Pacific will look like in the future is hard to say. The policy of England always was never to seek to bring about decisive action except in an overwhelming combination of political power and alliances, and in all probability British policy will seek to take and retain the lead in questions affecting the Pacific Ocean for many a long day to come.

It is rather interesting to note what the conservative Morning Post writes in its issue of June 13, 1923, with respect to the position of Germany in Pacific affairs:

> It is an important fact that the big interests of Germany (in the Far East), which had been swept aside completely during the war, are beginning to revive again. There are also indications pointing to an understanding between Germany, Russia, and Japan in this connection * * *. In Europe Germany is united in a commercial and political sense with Russia against the western powers. Russia, on the other hand, is trying to regain her position in the Pacific, and, moreover, not at the expense of Japan but in community of interests with her. Both parties (Russia and Japan) are naturally desirous of acquiring a big share of the influence enjoyed to-day by England and France, although the partners in this by no means impossible alliance are strangers at heart. Just now, however, they can, thanks to the similarity of the objects they are aiming at, do irreparable harm, only finally one fine day to start quarrelling amongst themselves. Whichever way we look at the problem we can not honestly say that the present balance of power in the Pacific is an ideal arrangement.

This balance of power suddenly seemed to be on the point of undergoing an entire transformation, not by forces under human control, when Japan became the victim of probably the greatest earthquake in history. That Tokio, the political and intellectual center, happened to be also the center of the catastrophe seemed to be fraught with tremendous consequences. It was interesting to read what the public press of the Pacific powers had to say on the subject, especially in England. There the possibility of Japan losing her position as a first-class power and its consequences were seriously discussed. It was even thought that it might be possible to drop the Singapore plan, the base which was to become an important link in the future defense of the British Empire.

What happened? Tokio, the capital, the principal naval port, Yokohama, and several other important towns, together with the Government offices, the centers of intellectual activity and of trade are more or less in ruins. A few hundred thousand lives have been lost. Two battleships of an old type and a few smaller vessels and dockyards have been destroyed, and possibly other losses of various kinds may not be felt in all their intensity and consequences for some time to come. But the energy of the Japanese people is as strong and unbroken as ever; that energy which has always proved unflinching and noblest in the history of the nation when the need of the homeland was greatest.

Now, as ever, Japanese policy places its trust in and is supported by an excellently trained army and navy, which no other Pacific power is capable of matching in concentrated power in the Far East for many a long year to come. And to-day probably no serious politician in England thinks of giving up the idea of making Singapore a first-class naval base. In fact, it is being seriously debated whether Trincomalee in Ceylon should not be made a big coaling station and auxiliary naval base as well, so as to establish yet one more secure stage on the road to the Far East. Yet, for all that, the consequences of the great Japanese earthquake are bound to affect the trend of Japanese policy for some time to come. But one had better not assume that wise self-restraint on the part of Tokio means the admission by Japan that her position as a first-class power is in any way modified.

How all these problems of the Pacific will be solved eventually is uncertain. There is, however, one thing certain about them, and that is that there nations will be opposed to each other or allied to each other which are noted for tremendous energy and political prescience. The political problems of Europe, too, will in future only be thoroughly understood by those who carefully study the development of the problems of the Pacific.

MOROCCO

GROWTH OF PATRIOTIC FEELING AMONG THE MOORS AND ITS POSSIBLE EFFECT ON THE MOROCCAN FUTURE

August, 1924

As the results of many conversations with Moors and non-French Europeans, as well as with two or three resident American business men, it appears, contrary to first belief, that a very strong patriotic feeling is beginning to develop among the Moors in the French zone which is apt to have a strong influence on the development of affairs in the country before long.

Fifteen years ago such a sentiment was practically nonexistent in Morocco. The only bonds drawing the various Moorish and border tribes together were of a religious nature, and the Sultan held his power far more through his religious leadership than through political. Religious fanatacism, involving hatred and contempt of non-Moslems, supplied the place of patriotism. Very little was known of the outside world and little interest was displayed in gaining such knowledge.

The intervention of the Powers in Morocco, the splitting of the Empire into the zone of the French Protectorate, the zone of Spanish influence, and the International zone at Tangier, the policy of the French in their zone, all have resulted in a new feeling among the native population. The results in the Spanish zone are well known and are, moreover, outside the province of this discussion except as indirectly having a repercussion on the French Protectorate. These remarks are confined to the latter.

The natives feel that the French authorities, while acting under the guise of a protectorate government, are in reality doing everything to reduce the status of the country to that of a colony like Algeria. It must be admitted that many things that have occurred and are constantly occurring give a color to this belief. This is especially the case with the budget question. Whenever there is a prospect of a good surplus of receipts over expenses the protectorate government suddenly discovers the need for a new building program of some kind that is sure to eat up the same. In this way the original debt owing to France by Morocco is in a fair way never to be paid, thus giving France an excuse in the eyes of the world to remain in control of national affairs here.

In the second place, the natives feel that the French authorities, in developing the country and in supposedly putting the country on its feet in a financial and economic way, are making no endeavor to train the Moors or to encourage them in improving themselves and their country. This sentiment is only too well founded. In spite of a fine program on paper, very little has been done in the agricultural and trade training of the native youth, all efforts being concentrated on the European colonists. Agricultural and stock-raising premiums and prizes are offered and expositions occasionally held by the protectorate government or under its auspices, but these are not for the benefit of the natives.

The growth of the national Moorish patriotic spirit is being manifested in various ways. Religious fanaticism is giving way to a much more tolerant feeling toward non-Moslems, a fact that is no better illustrated than by the increased intolerance shown by the Moors in the matter of allowing non-Moslems to approach and even

enter Moorish holy cities, districts, and shrines. The Moorish youth are showing a much greater desire to attain knowledge about the outside world. The more educated of all classes are exhibiting a great interest in national movements in other Moslem countries, notably Turkey and Egypt, and all news in regard to these developments is eagerly read and discussed.

Moors are not at all reticent about discussing their new ideas in the presence of foreigners who are not French or Spanish, especially the former. Several such conversations have been heard through a good interpreter, and, even though doubtless much was lost in translation, there was enough to afford much food for thought.

The Moors are showing a keen interest in the progress of affairs in the Riff and the marked failure of the French after 12 years to subdue or otherwise pacify the Atlas tribes.

By the foregoing remarks it is not meant to indicate that the result would be an armed uprising. Such a procedure on the level plans of Morocco would be madness in view of the present size of the French forces of occupation, and could only have a chance for success if a substantial reduction in the French army were followed by a concerted movement of the Riffians and the Atlas tribes. Under present circumstances a policy of "passive resistance" such as preached and acted upon by the followers of the Hindu leader Ghandi would be the one most likely to be followed here. This policy has been supported by Moors in several conversations.

The Moroccan problem is a very long way from being settled by the French, in spite of all the speeches and literature on the subject.

UNITED STATES

REPORT OF ANALYSES OF WATER SAMPLES TAKEN IN FOREIGN PORTS

1924

Herewith follow extracts from reports on the above subject received by the Navy Department from cruising vessels. It is believed that they may prove of value to the service.

From report of the commanding officer, U. S. S. *Milwaukee:*

During the recent shake-down cruise of this vessel into the South Seas opportunity presented itself to get samples of water available at various ports for delivery to ship.

As information relative to water supply, etc., is of interest to the Bureau of Engineering as regards use as boiler water, the samples are forwarded for anaylsis.

The information concerning the water is as follows:

Sample	Locality	Procurable from	Bulk delivery
1	United States naval station, Tutuila, Samoa, Station reservoir.	U. S. S. Ontario	By tug, 80,000 gallons.
2	Kings wharf, Suva, Fiji Islands.	Wharf pipe-line connection	Any quantity. No barges.
3	Sydney, New South Wales. City water mains.	Water barge, delivered alongside, at $2.68 per 1,000 gallons.	Capacity, 15,000.
4	Noumea, New Caledonia. City water. Souree, mountain stream.	Water barge, at $1.78 per 1,000 gallons.	10-ton capacity.
5	Truk, Caroline Island, boiler water. Souree, mountain stream.	Barge, 10-ton capacity, at $4.46 per 1,000 gallons.	10,000 gallons.,
6	Rebaul, New Guinea	At wharf pipe-line connection, at $4.46 per 1,000 gallons.	20,000 gallons.

From report of Engineering Experiment Station, re above. The six samples of water from various Pacific ports were analyzed and the following results obtained. In the following table the samples of water are listed as regards their desirability for use as boiler waters.

All of these waters should be submitted to distillation before they are used in small tube boilers.

	Kings Wharf, Suva, Fiji Islands	U. S. naval station, Tutuila, Samoa. Station reservoir	Mountain stream, Truk, Caroline Islands	Noumea, New Caledonia. City water	Sidney, New South Wales. City water mains	Rabaul, New Guinea
	1	2	3	4	5	6
Silica, grains per gallon	1.67	3.11	7.95	6.36	11.79	24.62
Iron and alumina oxides	0.09	0.20	0.25	1.17	1.31	2.33
Calcium carbonate	None.	1.41	None.	0.95	None.	None.
Calcium sulphate	Trace.	None.	None.	None.	2.46	Trace.
Magnesium chloride	0.36			0.78	0.60	2.20
Magnesium carbonate	0.19	9.45	0.92	None.	1.11	None.
Magnesium sulphate	None.	None.	1.38	None.	None.	None.
Sodium chloride	None.	None.	0.02	None.	None.	1.13
Total grains per gallon	2.31	5.17	10.52	9.26	17.27	30.28
Total solids at 500° C	5.78	7.43	17.38	10.46	19.46	31.10
Total solids at 105° C	7.94	9.37	22.22	21.65	33.96	34.43

From report of the commanding officer U. S. S. *Isabel:*

Two samples of water were obtained at two points on the Yangtze River, one at Ichang and one at Kiukiang. Tests were made with the following results:

	Ichang	Kiukiang
Salinity	Trace	0.1 of 1 per cent.
Alkalinity	0.3 of 1 per cent	0.2 of 1 per cent.
Sediment (by weight)	20 milligrams to 50 c. c	14 milligrams to 50 c. c.
Sediment (by volume)	1.2 per cent	0.8 per cent.

The above tests were made with the standard boiler-testing outfit, and by evaporation and precipitation. The sediment was a very fine brown powder.

This water has been used throughout the circulating and flushing systems of this vessel and has not shown any extraordinary corrosive or abrasive effects. Reports from engineers of vessels operating on the Yangtze River above Hankow report no ill effects from this water. In most cases river water is used in the boilers after having been filtered. It has been in use on internal-combustion engines on the Yangtze River for about 10 years and has not given any trouble, though it is recommended that in any large heavy oil engine being built for the Yangtze River, that the circulating water space be made slightly larger, also that at the bottom of the circulating chamber a plug be placed whereby the water may be drained off, also any sediment that may collect could be removed. The Standard Oil Co. are practically the only people using heavy-oil engines on the Yangtze River and the report of their engineer at Hankow is inclosed.

GENERAL CONDITIONS IN CHINA

September, 1924

After an absence of 18 months from Peking, where I had spent six years in all in close contact with China's political and international affairs, I was naturally much interested, when I returned there on 10 days' leave in May, to get in touch with those old friends, both Chinese and foreign, who are shrewd and sane observers, and learn what the changes had been and at the same time to see whether I could observe any marked changes on my own account.

It is the usual thing for foreign residents in China who go home to America or Europe on leave to remark when they return to China that the only difference they can see is a decided change for the worse. This is a hackneyed and lazy way of dismissing the subject; so while I feel that the briefest and easiest way of giving the sum total of my impressions would be to fall back upon that same verdict I also feel that the Office of Naval Intelligence is entitled to an outline at least of the reasons behind such impressions.

When I left China in the fall of 1922 Chang Tso-lin had been defeated by Wu Pei-fu, the latter was absolute master of Peking and of a good portion of the Provinces as well, and he was preparing to reinstate Li Yuan-hung as President, recall Parliament, and set up a government which most foreigners in Peking hoped against hope would give the country a responsible representative government, reunite China, and open a new era. Shortly after my departure a new government of a very respectable character was set up, and the situation looked hopeful. But before the year was out this Government was overthrown by conspiracy, a corrupt political gang came into full control of Peking, bought Parliament outright, and set up an administration fully as scandalous as any that had gone before. To make way for Tsao Kun, whose military prestige this

clique wished to "farm" to its own advantage. Li Yuan-hung was forced out of office by a high-handed coup in the spring of 1923; and in the fall, after the expenditure of something like $15,000,000 in "campaign funds," involving the frank bribery of about 500 members of Parliament, Tsao Kun was elected and a constitution promulgated. Every Chinese in the land, from the coolies up, recognized that all of this was a criminal farce, but there was no organized opposition: the new régimé was weakly recognized by the powers in return for certain pledges which have never been fulfilled, and the present Government of China is therefore nothing but an usurping clique of unscrupulous rogues, representing nothing but their own personal interests and supported by nothing but the provincial war lords, to whom Peking grants charters of exploitation.

There have been periods in China's history equally chaotic, but it would be hard to indicate a time when such political deviltries were carried out with so little of either dignity or shame. The fact that there have been no organized protests indicates that the people of the country have given up hope and are wholly apathetic. The country is as much divided against itself as ever and there are no prospects of reunion except through conquest under Wu Pei-fu, a task in which he is making conspicuously little progress. Kuang-tung is still independent under Sun Yat-sen, who supports himself with mercenaries from Yunnan, Hunan, Kiangsi, Shansi, and Shensi, nearly all ex-bandits, who devour the unbelievably heavy taxes imposed upon the Province. Yunnan is independent: Kuangsi and Szechuan are always chaotic. Chekiang, the last Anfu stronghold, in the very heart of the richest part of China, is independent. Chang Tso-lin has set up in Manchuria what is virtually a kingdom of his own. And throughout the territories nominally subject to Peking bandits are uncontrolled, the people are bled white by the military, and the high authorities take no orders from anyone, unless it happens to be to their advantage, and intercept the greater part of what used to be Peking's normal revenues.

In the capital Tsao Kun is surrounded by a close circle of ex-servants, relatives, and dependents, who censor all communications with him. Parliament takes no interest in any measure submitted to it unless it offers an opportunity to hold up the Government for bribes; and what few funds there are are so completely absorbed by the higher officials that the junior employees in the various ministries and bureaus, the public works department, and even the police go unpaid for months and even years. Changes of personnel bring no changes in practice, except that the newcomer in office, having ousted his predecessor by bribery and expensive conspiracy, is invariably more ruthless, shameless, and rapacious than those who

have gone before him. The police chiefs are confiscating Manchu and Government properties and are tearing down the city walls to sell them and line their own pockets. The streets are not kept up, street lighting is going by the board, street watering is almost wholly abandoned, the roads outside the capital have gone to ruin, and crimes of violence, almost unheard of a few years ago, are alarmingly frequent.

In the army, as in politics, the old spirit of loyalty and of a sort of filial fealty to senior commanders has almost completely broken down and any officer who finds himself in a position to take an independent stand sells himself from camp to camp without shame or compunction. A reproof or a transfer is no longer accepted as a disciplinary measure but as an invitation to the commanding officer to lead his men into the hills and turn bandit. Never a week passes without an incident of this sort in one part of the country or another.

The navy, which formerly stood aloof from these politico-military feuds, has now been drawn into them, and since I left China the whole navy has been bought up by one faction or another, is now owned by provincial overlords and is playing its part in the great game of keeping China chaotical. The significance of this may be understood when it is said that Peking can not move a single boat of the Chinese Navy without the consent of one provincial chief or another, and it is to be taken for granted that it would not be moved at all unless it were to the decided personal advantage of the provincial owner.

The railways are impoverished and are robbed of their revenues until there is not only nothing for upkeep but nothing for salaries. Some, like the Peking-Hankow line and the Chinese section of the Canton-Kowloon line, are so poor in engines, rolling stock, and repair materials that it is an adventure to ride on them.

The impression among all foreigners in Peking upon whom I relied for information because of their long residence in the country, their knowledge of it and their close association with highly placed Chinese, is that there is now absolutely no hope of China pulling herself together and evolving a respectable administration without the sort of outside help which her official classes are stubbornly unwilling to accept because the conditions which outsiders would naturally impose, if they were to give help in any form, would curtail their right to cut each other's throats for a share of officialdom's enormous loot. Without forceful intervention, which seems a long way off, it is felt that China will rapidly sink into a slough of complete anarchy and chaos and that if let alone the country will only begin to improve when the disruptive forces in it have com-

pletely exhausted themselves and the nation. This, by the way, is the opinion of scores of China's retired elder statesmen and was expressed by Marshall Tuan Chi-jui in a very forceful manner in a public interview last summer.

ANTIFOREIGNISM

All of the legations in Peking have, for considerably more than a year, been distracted with the problems raised by the increasing frequency and boldness of outrages upon foreigners and have been much more distressed by the obstructions put in the way of the administration of justice in such cases by officials of every class, but particularly by the military. A year ago this official attitude looked like indifference, but recent events have shown beyond all possible doubt that it is deliberate and has behind it a well-defined policy, namely that of abrogating the treaties through a kind of passive repudiation of them and of reducing the foreigner in China to a position where he will be at the mercy of Chinese whim and prejudice without redress.

This is a policy which did not originate among ignorant fanatics as the Boxer movement did, but among the officials, military commanders, intellectuals, students, professors, returned students from abroad, and, indeed, every class that is literate enough to follow the news and form opinions upon it. It has lately broken out in a most virulent form since China has entered into closer relations with Soviet Russia, but this latter manfestation must not be mistaken for the cause.

Superficial observers in the treaty ports, while noting clearly enough the changed attitude of every Chinese with whom they come in contact toward the foreigner and the decidedly hostile attitude adopted by the whole Chinese press, are inclined to think that this antiforeignism is something very new, traceable to some definite cause in the immediate past such as the World War, the loss of extraterritorial rights by the Russians and Germans in China, soviet propaganda, and what not. All of these may be contributing causes, but they are not the real root of the matter. The real truth, as all old timers in this country attest, is that the Chinese are no more antiforeign now than they ever were, but that they are bolder in manifesting their contempt of and dislike for the foreigner and their determination to break down his influence and prestige until they are in a position to expel him and all his works if they see fit. A missionary in Honan, in reply to a recent questionnaire about the growth of antiforeign feeling in his Province, replied that there was no growth of antiforeign feeling, but a decided lessening of the fear and respect formerly entertained for the powers of the Occident:

that the antiforeignism had always been there, but that it was growing in courage to show itself.

This opinion I have heard voiced in almost the same terms by all of my friends in China who are familiar with the language and have had intimate relations with intelligent Chinese. One American, who has been in close touch with Wu Pei-fu and his staff for years, had a talk about six months ago with the general's chief political adviser, a man of unusual ability and breadth of view. This person remarked, in discussing antiforeign demonstrations, "The Chinese are not opposed to foreigners as such. In the past we have taken in millions of outsiders from all around us, absorbed them and made them Chinese. We only object to people who come to China and do not conform to our traditions and standards, who stubbornly insist that we must conform to theirs. Anyone who can learn to think and act and live as a Chinese is welcome. The others are not."

In short, the root of antiforeignism is a conviction that the occidental (and to some extent the Japanese) is not assimilable. Extraterritoriality and the concessions in which foreigners live according to their own standards are ample evidence of this in the sight of every Chinese. Every Chinese, from the very lowest up, thinks that he is better than any white man who ever trod the earth; that his country is the greatest on earth; that nothing has ever been evolved that can even be compared with its culture; and that its people are the cream of all creation. One has to understand this to appreciate how bitterly the adherence of the occidental to his own standards, implying as it does a flat denial of Chinese superiority, is resented. The Chinese have never conceded us anything in their own minds but superior power, and this they never conceded until it was forcibly displayed. They never saw any reason for studying our ways and imitating us except that of grasping the secret of this superior power and of using it against us eventually. They have never abided complacently by the treaties and agreements that they have made with us except when they were convinced that they would be forcibly overwhelmed if they failed to abide by them.

Since the end of the Great War the Chinese have had many reasons to believe that the West was not so powerful, in its relation to China at least, as they had formerly thought. The failure of the various antibolshevik campaigns were noted with satisfaction. Russia repudiated all obligations and treated outsiders in Russia without a trace of respect, but got away with it. The results of the Washington conference robbed Japan of prestige and won her no good will in China. With oriental patience, persistence, and pro-

crastination the Chinese have for several years been trying to find out how far they can go toward rendering all the treaties, guaranteeing foreigners and foreign property safety and immunity from Chinese rapacity, null and void. And they are now rapidly reaching the point where they will be convinced that they can go the limit.

The American and the European Governments obviously do not understand this situation at all or they would not have followed a policy of toleration, conciliation, and fair dealing with the Chinese Government which has played directly into China's hands. The weakness shown in settling the Lincheng case, the calmness with which flagrant outrages upon foreigners and the acquittal of the guilty have been accepted by the legations, the promised increases in the customs tariffs when China was boldly defaulting on obligations amounting to $500,000,000, the remission of the Boxer indemnities at a time when the Government and the whole returned student body was urging the people on to force the abrogation of the treaties—these and a hundred similar steps have led the Chinese, step by step, to believe that we were retreating from our positions through weakness, since no oriental can conceive of anyone giving up anything that he is strong enough to hold. The Governments which fondly believe that they are cultivating China's friendship and good will by relaxing a grip upon foreign rights in China know nothing of the Chinese mind. They are earning nothing but contempt and are giving outlawry assurance. Those who think that the Chinese are grateful for the educational facilities offered them are wholly blind to the reason for China's interest in foreign education. China's attitude toward the countries which provide facilities for education is that of the Chinese or Japanese student who is so touchingly devoted to your person while he is trying to learn English from you and is with you every hour that you can spare him, unless you commence to converse with him in his own language, when his interest and devotion suddenly disappear and he never turns up again until he has something to sell you at double its value, on which occasion he prefers to speak in his own language.

The Chinese student educated abroad is the least grateful of all, because he has seen and learned things which have made dents in his national conceit and have made him wonder at times whether China was so vastly superior to all the rest of creation after all. A sneaking idea that the foreigner may to some degree be justified in his assumption of superiority, implied in his adherence to his own standards in China, makes him bitterer and ever more eager than the untutored native to lower foreign prestige and demonstrate to himself and others that the Chinese are after all the chosen race. His ability to realize what a mess his country is in and his knowledge

of the way the Occident must look upon China's international troubles makes the returned student class the most resentful of the presence of foreigners in China. The best trained and the most intelligent are the most dangerous. Men like Wellington Koo and W. W. Yen, who are liked best by the average short-sighted foreigner, who is flattered by their perfect imitation of his superficial ways, are the most energetic in their efforts to undermine the foreign position in China. The longer the powers fail to shape their policies by these truths, which are clear enough in the east but which are befogged by the utterings of sentimentalists in the west, the greater will be the mess that will eventually have to be cleaned up and the greater will be the eventual burden upon China about which these same sentimentalists are so solicitous.

RUSSIA AND CHINA

For several years past the most influential directors of communist policy in Russia have been studying Asia and edging their way into the confidence of all Asiatics through very adroit propaganda. In his last May day speech Leon Trotski announced that the U. S. S. R. was going to devote itself to the liberation of the downtrodden Asiatics from the imperialistic yoke of the west. The policy is not new. It was inaugurated several years ago when the astonished soviet propagandists realized that they were not only failing to make headway in Europe and America but that there was a decided reaction throughout the white world against communistic theories and practices. The first move toward the Orient was the establishment of an oriental revolutionary bureau in Irkutsk, founded about three years ago with the avowed purpose of creating such chaos through propaganda throughout Asia that it would seriously cripple the trade and therefore the prosperity of all the great exporting industrial nations. The order in which the movement was to be directed in the Far East was Mongolia, China, Korea, and then Japan. It is needless to point out that this order has been carefully followed. Mongolia was seized and revolutionized, China has borne excellent fruit already, and Korea and Japan await their turn.

The soviet mission in China is here with the simple and direct purpose of making things so lively through internal disruption and antiforeignism that overseas trade will be reduced to such a low ebb that industrial exporters abroad who depend upon China trade will have to close down and throw tens of thousands out of work and make them available, in a disgruntled state of mind, to communist preaching. During the first few years of the Bolshevist campaign in China the reds were content to preach communism to students, teachers, and other neurasthenic intellectuals in the large educational

centers, until they had a following of loyal disciples upon whom they could rely to spread propaganda for them. Then they opened their campaign against the Occident by denouncing to and through these mediums the imperialistic powers and offered, to fan this flame, to negotiate with China a treaty in which Russia would renounce all the special privileges and rights enjoyed by the Imperial Russian Government, and thereby set an example before all other nations to which China could forcibly call their attention.

The Russo-Chinese preliminary agreement repeats all these promises (not yet fulfilled), and since its signature the Russian envoy, Karakhan, his intellectual Chinese disciples, the dozen or more Chinese papers that he has subsidized, the returned students in a body, and the whole official caste has launched a campaign against occidentals and their treaty rights which is of the most inflammatory nature. The Chinese of every class take Karakhan's promises in good faith and believe that they have now found the moral support, if not the physical support, which will enable them to crush foreign prestige and power in the East. Russia is using China to ruin her and thereby discommode the Occident. China is using Russia to discommode the foreigner in China and make him knuckle under. For the moment it is a happy partnership, a mutually satisfactory alliance of the unfit. Each knows the other's game and each thinks himself so clever that when he has used the other to his own ends in full he will discard him. It is a dangerous situation for the occidental in China and one which, if it is to be met at all, ought to be met promptly, but it will not be. Neither our Government or Downing Street has ever understood China or her methods. There is only one answer, and that is forceful intervention; and this is the consensus of opinion amongst American and English business men. The longer forceful intervention is delayed the greater will be the disorderedness, approaching to anarchy, which will have to be eliminated and readjusted. "Forceful intervention" does not mean the military occupation of China, but an aggressive policy which will protect the foreigner and his rights in that country and which is willing to use force if necessary. How little force is required is only too evident, as shown by the Cockchafer affair. When the British gunboat commander fired a blank charge over the city and threatened to bombard the town, that very moment the Chinese behaved.

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In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines.

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OFFICE OF NAVAL INTELLIGENCE

MONTHLY INFORMATION BULLETIN

NUMBER 11—1924—NOVEMBER, 1924

FOR CONVENIENCE IN ROUTING

Officer	Initials	Date received	Date forwarded
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Executive Officer			
First Lieutenant			
Navigation Officer			
Gunnery Officer			
Communication Officer			
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Medical Officer			
Supply Officer			
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Second Division Officer			
Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

GREAT BRITAIN

AIRCRAFT RANGE FINDERS

September, 1924

For some time the British Navy have been proceeding with the development of a range finder to use from aircraft for particular service in scouting and reconnaissance, and also for giving the gun range to the main battle line prior to its being obtained from the low position range finders mounted on battleships. The device developed by the Admiralty is confidential and is covered in other reports. The Admiralty device is manufactured by Henry Hughes & Son (Ltd.) at their factory, Husun Works, Barkinside, Essex. The manufacturers now have in process at their works over 20 Admiralty pattern aircraft range finders, but their design staff consider that the instrument designed by the company is superior to that used by the Admiralty in that it gives a direct reading of the horizontal range and not merely the angle of depression of the object below the horizontal through the observer, as in the Admiralty type.

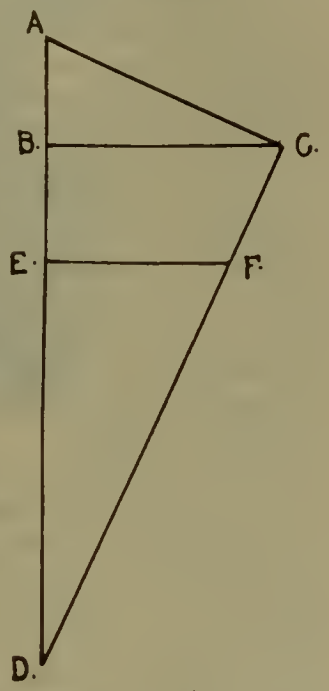

FIG. 1

It is believed that the question of developing a suitable range finder for use from aircraft should be actively taken up by our service in view of its possibilities, and in this connection there is given herewith a detailed description of the Hughes aircraft range finder as showing one solution of the problem:

The obvious method of ascertaining the horizontal distance of any object from any particular aircraft when the height is known (from altimeter) is to multiply the height by the cotangent of the angle of depression of the object below the horizontal through the observer.

There is no difficulty in measuring the angle of depression, but the calculation has to be made, and involves the use of a slide rule or tables. In order to avoid the inconvenience of the calculation, the present instrument was constructed to give direct reading of the horizontal range.

In figure 1 let A represent the position of the observer's eye, also let AB, measured vertically downward, represent the height of the observer above the earth; then BC, measured horizontally on the same scale, will give the horizontal range of the object lying on the line of sight AC produced; in conse-

quence of the scales of height AB and horizontal range BC being the same it can at once be seen that in constructing an instrument to utilize this principle the triangle ABC would sometimes be inconveniently large, and at other times too small owing to the necessity of working to some arbitrarily fixed scale.

In the present instrument the height AB has been arbitrarily fixed and consequently its scale is variable, i. e., the ratio of AB to the height of the observer above the earth is not constant but varies according to circumstances, similarly the scale of BC will vary to the same extent.

This variability of scale is overcome by operating the triangle ABC through an actuating bar DC, controlled by an auxiliary triangle DEF.

The auxiliary triangle DEF has D fixed on AB produced, so that BD is constant while DE and EF are constant scales of height and horizontal range, respectively, replacing the variable scales of AB and BC, which can be easily demonstrated by elementary geometry.

The result of introducing the auxiliary triangle system is thus to obtain two uniform scales of height and horizontal range, which can be conveniently measured or read off by screws or other simple means, and will form a convenient method of operating the instrument.

Any actual instrument must not only contain the means of dealing with the fundamental triangle ABC, but also means for insuring that the line BC is horizontal when line AC is correctly aligned on the object. Consequently, a bubble system has been incorporated, together with a partially silvered mirror, to reflect it into the field of view of the sighting telescope.

The various parts are described with reference to Figure 2, so that they may be readily identified. In the figure, R is the range screw, provided with a suitable operating head; it carries a conical portion (S) divided into 20 parts, alternately numbered 0 to 9, which gives the hundreds of yards of horizontal range, the unnumbered marks representing 50 yards. One revolution of the screw corresponds to 1,000 yards, and the number of thousands is shown on a wheel revolving inside the casing T, and showing the appropriate number of thousands, both from the front against an index line or from above through a window opening.

The threaded portion of the range screw passes through the nut N, which is free to slide up and down the actuating bar B.

The height screw H is provided with similar reading arrangements, reading to hundreds of feet, with intermediate markings for 50 feet, while the wheel figures show the thousands of feet. The height screw moves the whole of the slide on which the range screw is mounted, thus affecting the actuating bar and other working parts. It will be seen that the maximum height is thus 10,000 feet and the maximum range 30,000 yards; for larger heights or distances, the instruments can still be used satisfactorily if the observer sets to half the height and doubles the reading of the range screw.

It will, in general, not be found practicable to use the instrument below 4,000 feet elevation, nor will it usually be required; if, however, it should be required for use at low altitudes, the observer should set the height at two or three times the actual height, and divide the range indicated by two or three accordingly.

The viewing telescope V is attached to the bar of the instrument corresponding to the line AB of Figure 1, and has a fixed prism P placed immediately in front of it to erect the image, as the telescope itself is of the inverting type. It will be noted that although the image is erect, the right and left sides are interchanged; thus a target seen in the telescope apparently moving to the left is in reality moving to the right and vice versa.

Further, in front of the telescope and its erecting prism P will be found the partly silvered mirror M. This mirror serves to reflect the collimated beam from the bubble system into the telescope, and therefore must rotate at half the angular speed of the telescope, as the latter moves according to the de-

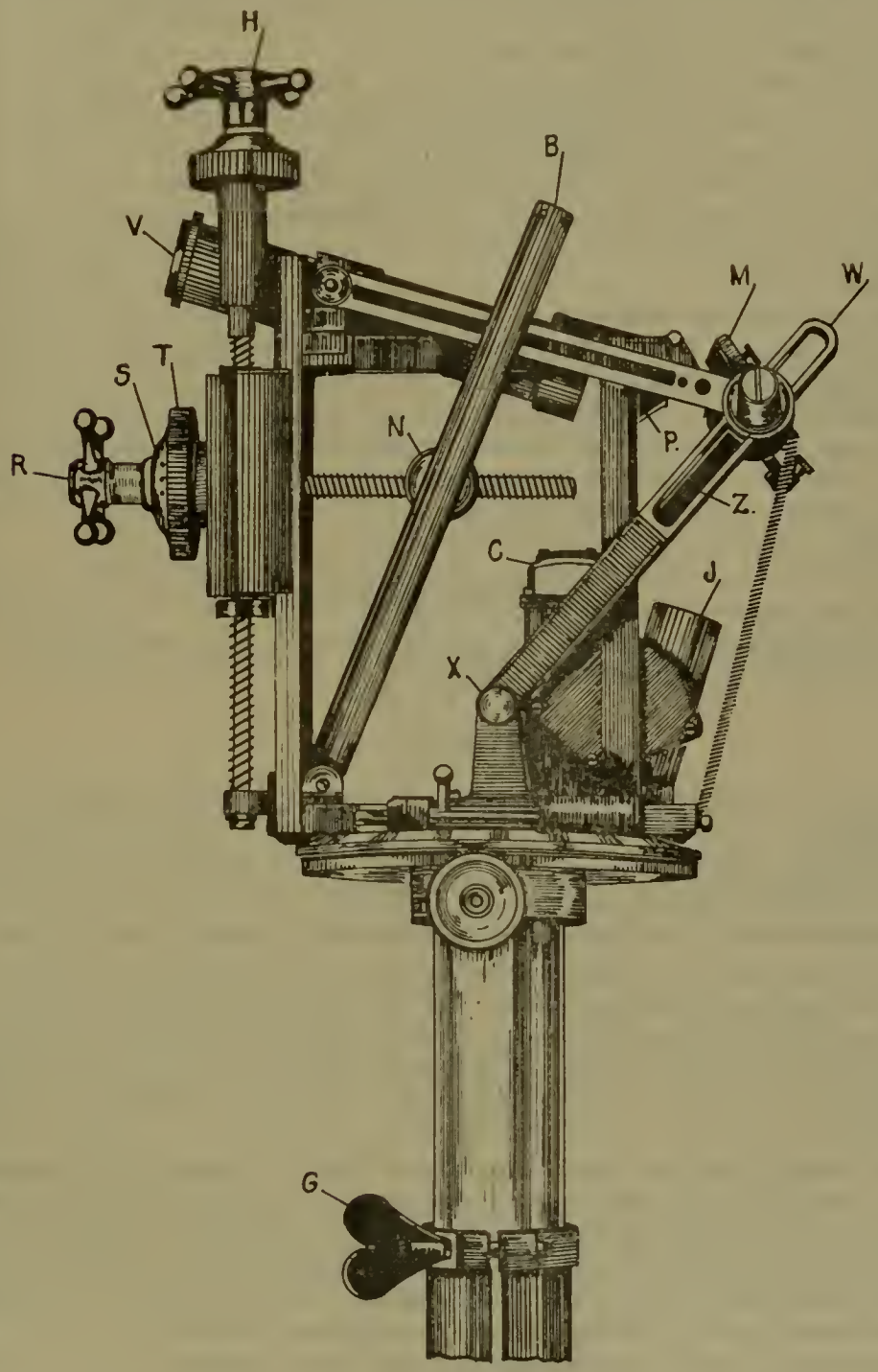

FIG. 2

pression angle. The angle of the mirror is controlled by slides W, pivoted at X, together with a tailpiece Z, which rotates the mirror. The mirror itself is provided with the usual adjusting screws and rotates in a conical bearing attached to the bar carrying the telescope, so that its position in front of the telescope is maintained during its rotation at half the angular speed of the telescope.

The bubble system consists of a vapor bubble, regulated by the screws L and K, contained in a transparent container.

The light is reflected into the system by the condensing prism C, passes downward through the bubble container and onto the triple reflection prism contained inside the main body of the casting; it emerges from the short tube J, which contains the collimating lens, as a parallel beam directed to the mirror M and so on to the telescope V.

As the equivalent of the collimating lens is equal to the radius of curvature of the upper internal surface of the bubble container, the bubble will maintain its position in relation to any external object (the target) when viewed in the telescope over the range permitted by the diameter of the bubble container; in other words, a small tilt of the instrument forward or backward will not have any effect on the observation, as bubble and object will move together.

The instrument is mounted on a stand provided with a horizontal circle divided to degrees, so that the azimuth of the target with regard to the direction of the observer's line of flight may be observed.

The range finder is hinged on the left side and provided with a bolt on the right side, so that it can be tilted to the left over a considerable angle if desired. The bolt is unlocked by pushing it forward; to return the instrument to its normal position push forward the bolt, return instrument to normal, and release the bolt, which will then lock the instrument in place.

The height of the instrument is adjustable to suit the convenience of the observer by means of the clamp G, and the instrument is attached to a bracket on the airplane by screws through the base plate F. Two base plates are provided for port and starboard brackets.

METHOD OF USE

It will be assumed that the base plates have already been mounted on the airplane.

Remove instrument from box and insert in one of the base plates and clamp at a convenient height to suit the observer's eye.

Slightly screw up the large bubble screw K till it engages about one and one-half threads, then screw up the small bubble screw L till some resistance is felt; the bubble should now be visible to the telescope, which should have been previously adjusted to focus a distant object. The bubble will in general be too large when first generated and should be reduced in size by releasing the small bubble screw L and, if this is insufficient, screwing up the large screw K.

The bubble should be left a little larger than is estimated to be required.

The bubble will generally appear at once without difficulty; but if it should fail to do so, it may have got caught inside the chamber; in this case, push forward the bolt on the right of instrument, securing it to the mounting, and tilt the instrument over to the left about 45° or so, returning it immediately to the normal position, when the bubble will usually appear.

Releasing the bolt after the return to the normal position locks the instrument in place.

If the bubble still fails to appear, screw up the small screw L a little more and repeat the sequence; also see that the large screw K is not screwed on too far.

The bubble having been produced, set the height screw H to the corrected altimeter and rotate the instrument in azimuth by means of the milled head

projecting just below the azimuth plate till the telescope points toward the target.

Now turn the range screw R till the target appears in the telescope and bring it to coincide with the bubble, center to center, using the azimuth screw of the base plate and the range screw as required. The horizontal range can now be read; the thousands of yards on the wheel and the hundreds and fifties on the divided cone.

As already mentioned, the effective range of the instrument can be increased by using the same multiples or submultiples on both scales.

PRECAUTIONS TO BE OBSERVED

After every series of observations the bubble screws K and L must be unscrewed till they are loose.

Care should be taken that in the course of turning the screws H and R the actuating bar B is not allowed to dip too far forward, so as to jam against the fitting which attaches the telescope to the upper bar. This does not mean restricting the useful range of the instrument, but that when the bar dips too far forward it should be brought back again by means of the other screw.

The instrument should be handled carefully and all sliding surfaces lubricated with acid-free oil of medium viscosity.

GREAT BRITAIN

MARINE AIRCRAFT EXPERIMENTAL ESTABLISHMENT, FELIXSTOWE

September, 1924

A visit was recently made to the marine aircraft experimental establishment, Felixstowe, Suffolk. This station is located on the north side of the estuary of the river Stour directly across the water from the port of Harwich and 84½ miles by rail from London. It was built during the war as a seaplane station, and was the scene of most of the experiments on the large types of seaplanes during the development. During the period of retrenchment after the armistice it was closed and left under the care of a small maintenance party. It was decided about one year ago to close the station at the Isle of Graine and transfer its activities to Felixstowe. This transfer was completed about July 1, 1924.

The station was built for activities far in excess of those now being carried on. There are barracks for approximately 500 men and three very large hangars with unusually high door clearance. The hangars appeared to be about 400 feet long and 200 feet wide. There are three large concrete slipways, each equipped with electric winch for hoisting out seaplanes. Officers' quarters are of the usual war-type construction, very comfortably furnished. The men's quarters are also of the 17-man hut type as built during the war; shops and storerooms ample in size and equipment. An unusual

feature was the existence of several concrete dugouts which were constructed during the war, and which had a capacity for affording shelter for the entire station personnel of that period, said to have numbered over 500.

The station is self-contained as regards lighting and power and uses municipal water supply. General condition of upkeep of buildings was good.

Personnel of the station at the time of inspection consisted of 38 officers and 341 men with a wing commander in command.

The primary mission of the station is the testing of new types of seaplanes and of modifications in old types. The secondary mission is serving as a base for a so-called development flight of six F–5 seaplanes.

In addition to the six F–5 seaplanes of the development flight the following types were seen:

N–4 or *Atalanta;* 4 Rolls-Royce Condor.

Vickers *Valentia;* 2 Rolls-Royce Condor.

Supermarine *Scylla;* 2 Rolls-Royce Condor (at present equipped with 2 Rolls-Royce Eagles).

Dornier *Comet;* 1 Rolls-Royce Falcon.

Fairey Modified III D; 1 Napier Lion.

Parnall *Plover;* 1 Bristol Jupiter.

Parnall *Plover;* 1 Siddeley Jaguar.

It was not permitted to enter the hangar, which contained the Gloucester seaplane built for the Schneider cup race, but it was understood that no other new or interesting types of seaplanes were in that hangar.

"N–4" OR "ATALANTA"

The design of this seaplane was undertaken in 1918 and it has passed through several phases. The completed seaplane represents the work of several different firms, the principal one of which was the Fairey Co. It is a biplane flying boat with span of 140 feet. The lower wing has a decided dihedral. The hull is of the supermarine type of design. The tail unit is of the biplane type with three vertical rudders. It gives the appearance of being very liable to weave as it is entirely independent of the main planes and their struts, and is dependent upon the rigidity of the hull. It was stated that weaving does occur but is not serious, but there appeared to be some work under way toward stiffening the hull. The *Atalanta* was jacked up for bottom painting and it was impossible to inspect the interior. Another feature which made a distinct impression was the amount of the overhang of the upper planes. It appeared excessive in view of the fact that the wing was not especially thick. The engines were arranged in tandem pairs. Each engine had a

very large oil tank, these tanks being mounted in the space between the tractor and pusher engines on each side and inclosed in a light metal faring, this faring having numerous ventilating slots. There was a large more or less streamline gasoline tank suspended from the lower side of the upper wing just inboard of each pair of engines. These tanks appeared to be of about 150 gallons each. It was stated that no fuel tanks had as yet been placed in the hull but that ballast was carried instead. Attempts were made to obtain from the escorting officer detailed information in regard to the official characteristics of the *Atalanta* without any great success. He stated that it had been flown several times and that it handled very well both on the water and in the air but gave the impression that these flights were simply preliminary in form and that no data had yet been obtained as regards load carrying capacity, climb, speed, etc. It appeared from questioning that to the best of the knowledge of the officers present no elaborate experiments had been carried on to ascertain the loss due to propeller interference on account of the tandem arrangement. The squadron leader stated that it had been assumed that this loss was about offset by consequent reduction in resistance and weight of mountings.

VICKERS "VALENTIA"

This seaplane was just taking off when the station was reached, and upon landing some hours later was hauled out to a buoy well away from the station so that there was no opportunity to make a detailed investigation. It appears to be a British *PN–7*, except that its span is approximately 100 feet. It took off quickly and well, climbed rapidly, and appeared to maneuver easily. The exact amount of load could not be ascertained, but it was said to have about three-fourths of a full load. The speed appeared to be somewhere from 75 to 80 knots. The engineering officer stated that the *Valentia* had been in service for several months and that he had not yet been called upon to make any repairs even of a minor nature to the Rolls-Royce Condors. These engines are equipped with electrical starters built in, and they are stated to give perfect satisfaction except that 125 amperes is required for starting and this necessitates the carrying of a very heavy battery.

SUPERMARINE "SCYLLA"

This seaplane was anchored out at the moorings and could not be inspected in detail. The following points were observed: The top plane was not on and it was said that it has never been on, as so far only taxi-ing and mooring-out tests have been held. Rolls-Royce Eagle tractors were installed on top of the present top plane. Large

cylindrical fuel tanks were fitted behind these engines. The hull was said to be satisfactory. It was also said that the water propeller gives maneuverability to the seaplane in its present shape under good conditions, but it was not believed that it would be of much use when the top wing is installed.

DORNIER "COMET"

The Dornier *Comet* was purchased for experimental purposes, especially as regards the metal hull and stub wing arrangement. The Benz engine had been removed and replaced by a Falcon. It was stated that the plane was found satisfactory in the air and on the water with two exceptions; these were that the rather flat-bottom hull pounded badly and that excessive wing vibration caused fears of crystallization of the wing roots. This latter was sufficient to cause tests to be given up.

FAIREY MODIFIED III D

This seaplane is identical with that seen at Lee-on-Solent and described in previous report.

PARNALL "PLOVER"—JUPITER AND JAGUAR ENGINED

These planes have now been adapted as seaplanes and gave an appearance very similar to the "Flycatcher" Amphibian. It was proposed to eventually develop them into Amphibians, but their performance as a seaplane is not good and their development was not carried through. The float design appeared crude, and it is understood gives a considerable amount of trouble. The position of the main step was slightly forward of the leading edge and there was an auxiliary step about 3 feet forward of the tail of the floats. Upon inquiry it was stated that the seaplanes behaved badly on landing and taking off and were rather inclined to porpoise. Oleo shock-absorber gear was fitted in a manner rather similar to that of the "Flycatcher" Amphibian, as described in previous reports.

The shop equipment was sufficient for complete overhaul of planes and engines and construction of such parts as might be desired for experimental purposes. The station practice is to overhaul engines about every 60 hours, and it was stated that this practice almost completely eliminates engine failures. This, however, is known to be an exaggeration, as the development flight operating out of Felixstowe has had a notoriously large number of engine failures in the recent past. The instrument shop had not been thoroughly established, but there were installed three calibrating devices which may be of interest. A new design vacuum chamber as manufactured by Negretti & Zambra had just been installed for the testing of

altimeters. This device consisted essentially of a metal chamber rectangular in shape, approximately 30 inches long, 24 inches high, and 18 inches wide, fitted with a door in the front, which door contained a heavy glass window. There was a similar window in the top. This chamber was hooked up to an electrically driven plunger air pump and also to a mercury column. The instrument was designed to work to a vacuum equivalent to 30,000 feet and was stated to function satisfactorily to that point. A test to 25,000 feet was observed.

A stroboscopic apparatus as designed by Tinsley & Co. was installed for the purpose of testing engine revolution indicators. This device consisted essentially of the electric motor to rotate the air-speed-indicator shaft, the disk mounted on the end of that shaft in the box inclosing the light, the second box containing the tuning fork, make and break arrangement for giving the flicker to the light illuminating the disk. It is understood that a device similar to this is installed at the Bureau of Standards in Washington.

Air-speed indicators were calibrated by a device manufactured by Alex. Wright, of London. This device consisted essentially of balancing the air pressure against a column of water, which column of water carried a float attached to a hand revolving about a dial graduated in knots so that actual readings could be taken.

GENERAL IMPRESSIONS

The general impression gained was that Felixstowe will be a very satisfactory station for its present mission as soon as its equipment has been completed.

GREAT BRITAIN

NAVIGATIONAL INSTRUMENT PLANT OF HENRY HUGHES & SON, BARKINGSIDE, ESSEX

September, 1924

The manufacturing plant of Henry Hughes & Son (Ltd.) was recently visited. This plant is located on a branch line of the Great Eastern Railway approximately 11 miles from London. The plant was established many years ago and was greatly expanded during the war. It was equipped for the manufacture of all parts of the usual navigation instruments, such as compasses, sextants, clocks, etc., but its principal product has always been compasses. The plant at the present time has about 300 employees, approximately one-half of whom are girls.

The primary purpose of the visit was to inspect the sample compass which the manufacturers had built at their own expense in ac-

cordance with the general recommendations contained in the inclosure with Bureau of Navigation letter of 12 August, 1924. Further modifications are being made in that sample compass, and the subject will be covered in a later report.

The entire plant was inspected and an opportunity was had to see the instrument which is now being used in British naval spotting planes for obtaining range. The existence of this instrument has been known for some time, but its details are regarded as secret. As a matter of fact, it is perfectly simple and the function performed by the instrument itself contributes but a slight part to the solution of the problem. It is simply an optical device for measuring the depression angle. Hence two instruments must be carried in each airplane, one to measure the depression angle on the firing ship and the other the depression angle on the target. Members of the firm appeared disinclined to discuss the use of the instrument, but the very nature of its construction gave the necessary information. It consisted essentially of a horizontal periscope approximately 24 inches in length and carrying above the eyepiece a housing containing a bubble device mounted on a small shaft capable of rotation around an axis parallel to the periscope. The top of the housing was fitted with a ground glass window for the purpose of illuminating the bubble. The outer end of the shaft carried a disk approximately 5 inches in diameter and graduated around its periphery in degrees and minutes. This disk was fitted with a milled head for the purpose of revolving the shaft. Around the tube of the periscope is the bearing, and projecting downward from this bearing is a shaft which fits into the mounting in the airplane. An accuracy of 6 minutes in arc on test observations is required under contract specifications.

The operation of the instrument is as follows:

The observer, looking into the eyepiece, rotates the periscope about its long axis until the object which he is observing is brought on the cross wires. Holding the instrument in this position, he then with his left hand rotates the shaft carrying the bubble until the middle of the bubble is also brought on the cross wires. The bubble appears in the left edge of the cross-wire field. The depression angle is then read off the graduated disk.

It is apparent from the construction of the instrument that it must be mounted for observation in the fore-and-aft line of the airplane. It is also apparent that the following conditions must be fulfilled in order to get data for accurate computation of range:

(*a*) The airplane must be in the vertical plane passing through the firing ship and target ship.

(*b*) The fore-and-aft axis of the airplane must coincide with that vertical plane.

(*c*) Observations with two instruments must be taken simultaneously.

(*d*) Accurate height measurement must be read simultaneously with observation.

It is understood that the readings of the two instruments and the altitude are sent to the firing ship and the range worked out on board the ship.

It was stated that the above-described instrument was being manufactured by the firm on orders from the air ministry and that they personally thought very little of it. Attention was invited to their own instrument. It will be noted that the Hughes instrument gives an actual reading in range instead of giving the depression angle. It was further pointed out that in the Hughes instrument the movement of the bubble was controlled in one plane by a slot in the bubble container. This is obviously a great advantage as, when looking through the telescope, the bubble is restricted to an up-and-down motion, the horizontal motion, due to the rocking of the plane about its fore-and-aft axis, being eliminated. It is considered that the Hughes instrument contains many features which would be of interest to the Navy Department, and the company has been requested to quote a price for a sample instrument.

There does not seem to be any reason why the Air Ministry depression-measuring instrument could not be mounted so that it could be rotated in azimuth and bearings read off. In that way it could be used without necessitating placing the airplane in the plane passing through firing ship and target.

The plant was principally engaged in the manufacture of aperiodic compasses for surface ships and airplanes. The number of compasses for surface ships being manufactured could not be ascertained, but it was stated that the output of aperiodic compasses at the present time is approximately 20 per week.

During a discussion of the development of aircraft instruments in general Mr. Hughes stated that the manufacturers are not given much encouragement by the Air Ministry. He said that the present policy seemed to be to confine the development of instruments to the Air Ministry and the Royal Aircraft Establishment at Farnborough, and then to place orders with the manufacturers for the building of the instruments in accordance with Air Ministry design. He gave as an example of this policy the fact that he had proposed to develop a bomb sight which would be a great improvement over the Wimperis Mark I.A, as now used, but that the Air Ministry discouraged such development and refused to consider making a contract for sample instruments. The principal feature of his development was to bring the compass into the optical field of the observer

and hence to obviate the necessity of his removing his eye from observation of a target to look at the compass, which is now mounted behind the eyepiece of the Wimperis instrument. He proposes to continue his development.

GREAT BRITAIN

TRIALS OF SUBMARINE X–1

September, 1924

It has been learned from a reliable source that the repairs and alterations of the main engines of the *X–1* have now been completed at Chatham, and the vessel has moved down to Sheerness to make her long-postponed full-power trials. On the preliminary run trouble was again experienced with the main engines, which are of Admiralty experimental design. It has been reported previously that the engines are designed to develop 3,000 b. h. p. each. It is now learned that this power is to be given by 8 cylinders. Since the German 3,000 h. p. engines had 10 cylinders the Admiralty engine would appear to be a more highly stressed piece of machinery.

JAPAN

ESTIMATE OF THE STRATEGIC SITUATION OF THE JAPANESE EMPIRE

(October, 1924)

(Prepared by a committee at the Army War College)

(1) GEOGRAPHIC SITUATION

1. *Strategic aspects of the geographic outline of the Japanese Empire.*—The Japanese Empire, a chain of islands extending from the southernmost tip of Kamchatka on the north to the Batan Islands of the Philippine Archipelago on the south, and including the lower half of Saghalien, the Korean Peninsula, and the Kwantung Peninsula, controls the approaches to the eastern Asiatic shore and the trade routes of the western Pacific.

Additional strength to its position as a controlling factor of Pacific trade routes is given by the mandate granted Japan over the Mariana, Marshall, and Caroline Islands.

Approach to the main islands of the Empire—Honshu, Hokkaido, Kyushu, and Shikuku—except from the west, must be made over great distances and is subjected to flank attacks from Japanese possessions.

2. *Location with respect to other powers and her own dependencies.*—Japan is geographically so located as to be contiguous to the sphere of activity of the following powers: United States, Great Britain, France, Holland, Russia, and China. Any one of these powers or a combination of two or more of them might become her enemy.

Her natural allies, geographically, are China and Russia.

Japan is separated by comparatively narrow strips of water from all her dependencies except Formosa and the mandate islands of the Pacific. Formosa lies 800 miles southwest of the main islands of Japan, but is connected thereto by the Luchu Islands. The mass of the mandate islands lies even farther away and its connection with the main islands is less definite.

3. *Location with respect to the sources of her vital imports.*—Japan being an island Empire, with her industrial life centered in her four main islands, her vital imports must follow water routes into the Empire. The nature of these imports is discussed in another part of this report. A severance of the water routes over which these imports pass would, it is believed, destroy the industrial life of Japan and consequently her ability to maintain herself in time of war.

4. *Geographic features of the coast line of the Empire.*—The defensive strength of the Japanese Empire is materially augmented by the character of her coast line. The eastern faces of her insular and peninsula coasts is generally precipitous and forbidding. The western coasts, which in Korea and Formosa are less rugged, are lined with mud and banks. She is favored by nature with a large number of good harbors, those on the Inland Sea being particularly well located strategically.

5. *Military aspects of the topography and climatic conditions of Japan.*—Generally mountainous, with the ranges paralleling the coast line and its intervening valleys highly cultivated, those in the main islands being devoted largely to rice culture, the Japanese Empire presents a serious problem to an invading force. The terrain lends itself readily to defense and, as will be shown later, the railway system is so adapted to quick concentration of defending troops that, assuming the successful landing of an invading army, the further progress of this army would be very questionable.

The climate of the Empire varies from that of the Arctic Zone to that of the Tropical. That of the main islands, while temperate, is very rainy; the islands themselves have frequent fogs and are subject to typhoons and earthquakes.

These climatic conditions are believed to be an added disadvantage to an invading force.

6. *Location of important agricultural, industrial, and mining areas with respect to the frontiers.*—For reasons stated above those areas which are usually considered sensitive are believed to be practically inaccessible and search must be made elsewhere for the weak points in Japan's armor. These are believed to be sea routes leading to the Empire, for with these open Japan would be a most formidable opponent.

7. *Natural routes of invasion to and from neighboring States, with climatic conditions and natural obstacles to be encountered in the theater of operations.*—The neighboring States are China and Russia. Natural routes into China are up the Yangtse Valley or to Peking via Taku: into Russia via Vladivostok. No insurmountable obstacles exist and the climate, though rigorous in the north, would not preclude military operations all the year. Routes into Japan proper would have to cross the seas and the difficulties attendant thereon have been previously discussed.

8. *Influence of geographic factors in determining the foreign and military policy of Japan.*—Japan is an inland empire dependent upon industrial life for her prosperity. She is deficient in raw material with which to carry on this industrial life and must import. Much of this importation is from China and Siberia. A strong unfriendly nation on the eastern Asiatic shore could stop this flow of raw material and cut her communications to the south. She, therefore, feels that domination of eastern Asia is vital to her national existence. To keep open her sea routes, protect her shores, and maintain this domination, she needs a large first-class navy backed up by a small, well-trained army susceptible of quick expansion.

(II) POLITICAL SITUATION

A. INTERNAL CONDITIONS

9. *Study of the people.*—The population of Japan proper is fifty-eight and one-half millions. The yearly increase in population is six hundred thousand. Including Formosa and Korea, the population of the Empire is eighty and one-half millions.

The Japanese race was formed from a great diversity of sources. Those included the Ainus who were aboriginal inhabitants of Japan, the Idzumo men who came from the north of Asia and were probably Mongols, small sprinklings of Koreans and Chinese, and lastly the Malays, who formed the dominant element and impressed their characteristics most strongly upon the race. No other racial admixtures have occurred for at least fifteen hundred years. This fact, together with Japan's isolation by the sea, has resulted in bringing the race to a high degree of homogeneity. They have developed a strong national consciousness, pride, and ambition.

The Japanese have always been a military people. The soldier has always stood at the top of the social scale. Their history is a record of conflict. They endure hardship with less discomfort than the white races. Individually they are stoical, obedient, and imbued with a respect for authority. Physically they are not to be compared with the American or with the races of northern Europe. They are, however, possessed of considerable physical endurance. Individuals are apt to lack initiative. In general, after summing up military qualities, they must be classed as good soldiers.

The psychology of the Japanese people is marked by the following traits: Adaptability, emotionalism, fanaticism, reverence for the Emperor, belief in the efficacy of war, and an intense pride of race. They are absolutely lacking in the possession of a sense of humor. This causes them to always take themselves seriously and to believe too strongly in their own importance.

Japan has been called the Prussia of the Far East, and certain characteristics which distinguished imperial Germany are evident in Japan to-day. She has set up her national destiny as a fetish, the worship of which has resulted in a state of exaltation of the national mind. She envisions herself as the head of an Asia freed from western influence. The Japanese pride of race having been affronted by our exclusion law, there is now evident in Japan an intense hatred of everything American.

From a consideration of the above, there is no doubt that the Japanese people are possessed of sufficient solidarity, endurance, and resourcefulness to sustain a prolonged war. Furthermore, in case of a conflict between Blue and Orange, the war would be a popular one.

10. *Study of the State.*—Although from a theoretical point of view Japan is considered a constitutional monarchy, it is in reality governed by a class—the bureaucrats. The Emperor, in accordance with tradition, holds himself aloof from politics and acts only upon the advice of his counselors. These are always men who entered the national service in the bureaucracy. Japan has the most highly centralized government in the world to-day. This would be a strong factor in her favor in the successful prosecution of a war.

"The Emperor is sacred and inviolable." In him are centered all legislative and executive powers. He sanctions and promulgates laws or vetoes them. He has power to dissolve the lower house of the Diet or to prorogue the upper house. He determines the organization of the different branches of the administration, fixes the salaries of civil and military officers, and appoints and dismisses officers. The right to declare war and to conclude treaties of peace is also vested in him. In addition, he commands the army and navy, grants titles of nobility, and has the power to pardon or commute punish-

ments. The personal influence of the Emperor over the masses of the people is tremendous.

There are five advisory councils which exercise most of the power in the State. The Emperor invariably acts in accordance with their advice. These councils are: The Genro, the Privy Council, the Cabinet, the Advisory Council on Foreign Affairs, and the General Staff, which dictates the military policy of the State and "is independent of every agency of the Government but the Emperor himself." Some of the members of one of these councils are apt to be found sitting as members of one or more of the other councils. The result is an interlocking directorate. The influence of the army and navy in these councils is so great that frequently these two branches of the Government are found to be dictating the foreign policies of the nation.

The Imperial Diet, which is the legislative branch of the Government, consists of two houses, the House of Peers and the House of Representatives. The House of Peers is composed of members of the imperial family, of the orders of nobility, and of persons nominated thereto by the Emperor. The House of Representatives is composed of members elected by the people. All laws require the consent of the Diet, and budget bills must first be laid before the House of Representatives. The House of Peers in reality exercises the veto power over the lower house and holds the whip hand over the Prime Minister, since it can not be dissolved. The peers have always supported bureaucratic cabinets but have frequently shown their displeasure toward party cabinets with a consequent fall of the ministry.

The judicial system is modeled on that of France and consists of local courts, district courts, courts of appeal, and a supreme court.

Japan is divided into 46 prefectures, the governor of each being appointed by the Minister of the Interior.

Formosa and Korea each has a governor general who may be either an army officer, a navy officer, or a civilian. Sagalien has a civil governor.

Education is compulsory and there is little illiteracy.

To qualify as a voter, a Japanese subject must be a male, 25 years of age, and must pay a direct national tax of 3 yen. Consequently, there are only 3,000,000 voters, and the present government can not be said to reflect the views of a majority of the people.

The principal political parties are the Kenseikai, the Seiyukai, the Kakushin Club, and the Seiyu-honto. The present cabinet is supported by a coalition between the first three, and the latter forms the opposition. There are no irreconcilable differences between the parties. Their action is governed mostly by expediency. They are

supported in large part by the capitalists and large landowners in return for favorable legislation. Party politics in Japan are corrupt. In case of a war all parties could be expected to unite in support of the Government.

Japan being an industrial nation, has had her share of labor troubles. In the past these have usually taken the form of direct action against the owner of the factory. Labor is just beginning to have a class consciousness, and the labor movement lacks direction. It is, therefore, difficult to determine whether labor constitutes an economic or a political issue. The political parties are not interested in labor, since it has no vote.

Korea may perhaps be considered to be a source of weakness within the Empire. The Koreans cordially dislike the Japanese. They will probably not rebel in case of a war between Japan and another power because of the following reasons: First, racial apathy; second, experience of Japan's methods when rebellion has been tried in the past; third, because Korea is Japan's bridgehead on the mainland of Asia and the country will, in all probability, be strongly garrisoned in war. However, should Korea be occupied by the troops of a power at war with Japan, it is believed that the Koreans would welcome the occupation. They have always been friendly to Blue. In case of war Korea would present a fertile field for propaganda and her population would not be a military asset to Japan.

The quality of present-day political leadership in Japan is high. No one ever attains political power in that country without having spent years in subordinate positions in the Government. The Kiyoura Cabinet fell last June and a new ministry was formed by Viscount Kato, who has been out of power for nine years. He has pledged himself to a policy of retrenchment, universal manhood suffrage, reduction of the army, and reform of the House of Peers. It is also expected in Japan that Kato will adopt a strong policy toward the United States with respect to the exclusion law. What the outcome will be can only be conjectured at the present time. The militarists are firmly entrenched and a large reduction in the army does not seem probable. Kato has gone on record as desiring to bring the matériel of the army up to date, when interpellated in the House of Peers.

The House of Peers can only be reformed by its own consent, and from selfish reasons it is hardly likely to curtail its own powers.

The bureaucrats desire universal manhood suffrage in order to offset the power of the parties, which is increasing. The parties, on the other hand, do not desire universal manhood suffrage because they derive their strength from a limited electorate whose power would be greatly diminished by an extension of the ballot. If uni-

versal manhood suffrage comes into effect, the result will be the formation of a strong labor party and perhaps a trend in the direction of democracy. Even should the Cabinet be made responsible to the Diet instead of to the Emperor, it is believed that the consequent decentralization of the Government would be more than compensated for by the extreme loyalty of the people to the Emperor. It follows that from the point of view of internal political conditions alone Japan is able to support a serious war of long duration.

B. FOREIGN RELATIONS

11. *General.*—A study of Japanese history as well as her current acts makes it safe to assume that she aspires to racial equality for her nationals, to territorial expansion, and to dominate the Far East economically and politically.

Japan's national growth and development in quest of the aims above indicated will be governed and directed more by the conditions of the Washington conference treaties than they ever have been before. Japan, having accepted these treaty obligations, to which the nations trading and having territory in the western Pacific Ocean are also committed, must so conduct her procedure for national development as not to come into serious treaty conflict with these powers. It is not reasonable to expect that Japan or any other nation will alter national policies so fundamental to her existence. All that she need do is to alter her method so as to remove treaty friction in accomplishing her aims. Japan seems cognizant of this procedure and will devote herself to the task of national development along pacific lines until she finds herself losing in the competition with other powers. She will then take action that seems most expedient.

12. *The United States.*—Japan's relations with the United States during the closing days of 1923 and first part of this year, 1924, were never in better condition, due to the aid rendered by the United States to her in her distress following the earthquake of September 1, 1923. Then came the agitation on the Japanese exclusion question in Congress and the law, effective July 1, 1924, which excluded aliens ineligible to citizenship. This was and still is very objectionable to Japan and her people. President Coolidge in approving the bill commented thereon in part as follows:

> The bill rather expressed the determination of Congress to express its prerogative in defining by legislation the control of immigration instead of leaving it to international arrangements.

Although Japan evidently accepted the President's statement, the sting remains. Japan must realize and appreciate our trade relations with her; they are all most vital to her development. This

factor is a strong one in favor of United States against aggression by Japan. The United States attitude in the Pacific Ocean is unmistakably set forth in the Washington conference treaties and resolutions and causes Japan no fear. Particularly so since she sits astride the United States line of communication to the Philippine Islands, surrounds Guam, and is in actual possession of Yap, all by reason of her control of the German mandated islands in the Pacific north of the Equator.

13. *Great Britain.*—Acts of Great Britain (South Africa, Canada, Australia) representatives at the meeting of the League of Nations at Geneva, 1924, have precipitated race questions with Japan like that the United States has just passed through. Japan is not in a position to resent this from Great Britain any more than she is to resent the attitude of the United States. Relations between these two States in the Pacific Ocean are covered in detail in the treaties of the Washington conference. Great Britain's position in the German mandated islands, south of the Equator, protects her interests in that locality from Japanese aggression should such ever become desirable on Japan's part.

14. *China.*—The affairs of China have been safeguarded to a wonderful degree from aggression by any and all nations with territories in the Pacific Ocean by the terms of the treaties and resolutions resulting from the Washington conference. Her territorial integrity and sovereign rights have been cared for, and the "open door" policy for trade has been reaffirmed.

The Chinese civil war is apt to affect adversely Japan's trade with China and Japan may have to intervene sooner or later in the interest of some of her nationals in Chinese territory. This situation is not altogether encouraging.

Japan's attitude of neutrality in the Chinese civil war is open to question. Transportation favors seem to have been extended to Chang Tsao Lin's army on one occasion and denied on others.

15. *Russia.*—Recent reports indicate that Japan has recognized Russia's Soviet Government. Details are not at hand. Japan has apprehensions of effects of soviet diplomatic agents on her populace. Japan at present can forcibly dominate her will upon Russia. Peaceful methods, however, are being used and it is presumed normal international relations between these nations will follow.

16. *France and Holland.*—Both of these countries are enjoying increased trade with Japan, understandings have been reached by both as to Japan's rights in the Pacific, and Japan knows the rights of these States in the Pacific, due to treaties and resolutions of the Washington conference.

17. *Belgium and Portugal.*—These nations are signatories of the nine power treaty of the Washington conference with Japan, and

thus have full knowledge of the Pacific Ocean situation and the resolutions passed in reference to China. No special reason exists for international clashes with Japan.

18. *Italy.*—Has full knowledge of Pacific Ocean conditions by reason of her position as a world power and as such a signatory power to the treaties of the Washington conference. Wide geographical separation tends to separate these States. No friction is apparent.

19. *Germany.*—This State has disappeared from the Pacific, and consequently is no longer an irritant to Japan in territorial matters. Cordial relations will probably be cultivated, due to early association in governmental and army affairs.

(III) ECONOMIC SITUATION

20. Due to weaknesses in raw material, unfavorable balance of trade, limited territory, and dense, rapidly increasing population, Japan is economically restless and may be expected to energetically continue her policy of encroachment toward Asia at every favorable opportunity.

A. FOOD

21. Japan exports considerably less food than she imports, but both items are of relatively small importance, in view of the fact that the great bulk of food now utilized is produced in Japan. An analysis of the food situation shows that by a reasonable system of rationing sufficient food is produced to support the population now and for a period of at least eight or ten years in spite of the rapid increase. The only factor of serious concern is the failure of nitrates in the form of fertilizers upon which crops are dependent. By employing all manures, fish and bone wastes, and further development of various nitrate-extraction processes the deficiency can be overcome and the agricultural dependence on foreign imports terminated.

B. INDUSTRY AND MUNITIONING CAPACITY

22. The abnormal growth of industry in Japan during the World War resulted in an economic depression when exposed to after-war competition. The largest producer of silk in the world, Japan derives the greatest part of her income from the sale of this commodity to the United States. Any break with the country mentioned would have a very bad effect on industry and credit.

Power, in the way of coal and hydroelectric projects, are considered ample for industrial needs. Labor, somewhat affected by radical propaganda, is plentiful and relatively cheap. The industrial facilities, in the way of factories, arsenals, and other plants, are numerous and well developed, and could be expanded to cover

all war needs in 18 months. While in certain lines of mineral products Japan is well supplied, the relative poverty in iron is a source of weakness economically which will always prevent her from successfully competing, in a large way, with other countries more plentifully supplied. Raw cotton, wool, and rubber are almost entirely lacking, and many other articles essential to industry, but Japan is complemented to a great extent by China in the articles she lacks.

The munitioning capacity is entirely dependent on the receipt of adequate raw material. Shut off from the outside world, the production, except for small arms, would soon fail and result in economic exhaustion. With access to the neighboring coast of Asia and its resources, Japan could continue sufficient industrial activities, under war conditions, for an indefinite period.

C. FOREIGN COMMERCE

23. The principal feature of Japan's foreign trade is the excess of imports over exports for 1923 and 1924, being 536,000,000 yen and 670,000,000 yen, respectively.

The principal items of import are raw cotton, crude rubber, metals, flour, raw sugar, wools, and nitrates. Crude rubber and cotton are not produced, and she must import the raw materials.

She must import practically all wool used. She also imports most of her machinery, and is not in a position to turn out such articles in large quantities. For all of her imports she is practically dependent upon her silk exports and exports of manufactured cottons and woolens for exchange or credit. Her credit has been good. She suffered materially from the earthquake, but is rapidly recovering. The greater part of her trade is with three powers—China, including Kwantung; the British Empire; and the United States. Exports, 90 per cent; imports, 85 per cent. By continents, about 80 per cent of this trade is with Asia and North America, Asia slightly in excess. This practically confines her trade to the Pacific and Indian Oceans. This trade is increasing, especially so with Australia and the Dutch East Indies.

In shipping she has about 3,600,000 gross tons of steam and 950,000 gross tons of sailing ships. This is believed to be sufficient for any probable demand. Her ships are of inferior type, and consequently the bulk of her trade with distant ports is carried in foreign bottoms.

D. FINANCE

24. Japan's finances are on a sound basis.

Her currency is well secured and she has adopted the gold standard for carriage. Taxation is heavy, but less than that of most other powers. The budget is supervised and capably administered.

The army and navy require large appropriations, and this condition may be considered as lasting.

There will be a heavy deficit in industry for this year, and exchange is at the lowest rate recorded since 1890. Expenditures and receipts are made to balance. Her indebtednuess has increased 1,000,000,000 yen in the last year, due mainly to appropriations for rehabilitation of losses occasioned by the earthquake of September, 1923.

Her gold reserve is about 1,600,000,000 yen, of which about 500,000,000 yen is held abroad.

The banking system is sound, well regulated, and properly supervised. The deposits and reserves show the banks well secured against losses. Her wealth, however, is dependent upon her industries and may be regarded as acquired and not inherent wealth; consequently she is dependent upon foreign trade for credits abroad.

E. COMMUNICATIONS

25. *Railroads.*—Japan has an excellent railroad net, suitable for quick concentration of her troops. She has sufficient rolling stock to meet such demands as may be made by the military situation without material inconvenience to ordinary life of the country.

26. *Roads.*—Although the Japanese Empire has a complete network of roads, they are generally poor. Bridges are numerous and can not sustain great weight.

27. *Shipping.*—There is ample tonnage to land 530,000 men on the Asiatic shore in M plus 35 days; to land troops in the Philippines at the rate of 200,000 men per month and still carry on the necessary trade.

28. *Airways.*—These are in the making. A great increase of aerial activity is expected in the immediate future.

29. *Waterways.*—These are insignificant.

30. *Motor transport.*—At present the road situation is such that the use of motor transport away from the vicinity of the largest cities is impracticable.

31. *Animal transport.*—Reports indicate that Japan has sufficient animals for military purposes, though the draft horses for artillery are deficient in quality.

32. *Cables.*—A complete cable system, Government control, exists in the Empire.

33. *Telephone system.*—Japan has an extensive telephone system, but it is very inefficient. It is Government controlled.

34. *Telegraph system.*—Very extensive system. Government controlled. Overhead wire generally used.

35. *Wireless telephone.*—This is not yet established generally but is used in a few places. Government controlled.

36. *Radio.*—The Empire possesses a very complete radio net throughout the main islands and all possessions. It is being materially augmented at present. Under strict Government control; no private instruments, listen-in sets, etc., are permitted.

(IV) MILITARY SITUATION

A. PERMANENT MILITARY AND NAVAL ESTABLISHMENTS—MILITARY DOCTRINE—RESERVES OF FINISHED MUNITIONS

a. General military policy

37. Japan's general military policy is to maintain armed forces sufficiently strong to allow her to advance her national aims on every opportune occasion. Under this policy she maintains an army by conscription, a navy by voluntary enlistment supplemented by conscription, and a police force by voluntary enlistment.

The primary mission of the navy is to form the first line of defense by sea and to protect her sea communications. That of the army is to form the second line of defense for Japan proper and the first line of defense for that part of the Asiatic mainland now dominated by Japan.

b. *The permanent military establishment*

38. *Strength.*—Japan now has 250,000 officers and men with the colors; 615,000 first reservists, 799,000 second reservists, and 540,000 other trained reservists, a total of 2,154,000 trained soliders. Of these, 17,500 are active officers and 28,869 are reserve officers.

39. *Organization and distribution.*—The Emperor is the supreme head of the army and navy. He controls the army through the War Department, but on the advice of a board of marshals and admirals and of the Supreme Military Council. This board and council largely control the military policy of the Empire. The War Department has three independent divisions—the Ministry of War, the General Staff, and the Inspectorate. The chief of each reports directly to the Emperor. The Ministry of War corresponds roughly to the branches of our War Department. The General Staff performs much the same functions as does ours in so far as operations, war plans, and intelligence are concerned. The Inspectorate has charge of training.

No corps organization exists. Army headquarters are provided for Korea, Manchuria, and Formosa. Japan is divided into 18 divisional areas, and the army in Japan is administered through the commanders of these areas—normally division commanders.

Japan now has 21 active divisions of about 9,000 each—war strength about 20,000. Normally, 19 of these are stationed in Japan

and 2 in Korea. The guard division is not assigned a divisional area. At present one division is in Manchuria and battalions are detached from divisions in Japan and stationed four in Saghalien Island and two in China. In addition, Japan maintains the following active units:

Four cavalry brigades, attached to divisions in Japan.

Four heavy field artillery brigades, attached to divisions in Japan.

Two mountain artillery regiments, attached to divisions in Japan.

One horse artillery battalion, attached to divisions in Japan.

Four infantry regiments, permanently assigned to Formosa.

Two mountain artillery batteries, permanently assigned to Formosa.

Four infantry battalions, railway guards in Manchuria.

Three fortress artillery regiments, throughout the Empire.

Eight fortress artillery battalions, throughout the Empire.

Two railway regiments, throughout Japan.

Two telegraph regiments, throughout Japan.

Six air battalions, throughout Japan.

One balloon company, near Tokyo.

One motor battalion, near Tokyo.

Three thousand military police, throughout the Empire.

No chemical warfare units.

The infantry division consists of two infantry brigades of two regiments each, one field artillery and one cavalry regiment, and one engineer and one transport battalion. A machine-gun company (18 machine guns) is being provided for each infantry regiment. In peace each infantry regiment has three battalions of three rifle companies each. In war each of these battalions will have four rifle companies and one machine-gun company (12 machine guns). Divisional artillery regiments have three battalions of two 4-gun batteries each. In war each battalion will probably have three battreies. Divisional cavalry regiments have two squadrons in peace and three in war. Regiments in brigades have four squadrons, and a brigade consists of two regiments.

Field armies will probably be formed in war consisting of from two to six infantry divisions, one or more brigades of cavalry, army artillery of light and medium calibers, antiaircraft artillery, pursuit and observation aviation, and other auxiliary troops. Armies will be combined into groups of armies.

40. *Equipment.*—The caliber of the rifle and automatic weapons is 6.5 mm. These weapons are probably up to modern standards. The infantry is armed with rifles, bayonets, light and heavy machine guns, 37-mm. guns, and 3-inch infantry howitzers; the cavalry with carbines, bayonets, sabers, and light machine guns. Divisional artillery regiments are equipped with 75-mm. Krupp pattern field

guns having a maximum range of about 9,300 meters. Two regiments have instead 75-mm. mountain (pack) guns having a maximum range of about 5,000 meters and a rate of fire of 12 shots per minute.

The 155-mm. horse-drawn howitzer (maximum range 8,000 meters) and the 10.5-cm. tractor-drawn gun (maximum range probably under 15,000 meters) are the standard heavy field artillery types. Other types exist of no greater caliber or range, and larger and more powerful types are under development. Fortress artillery is of diverse types, varying in caliber from 14-inch (possibly 16-inch) to 12-cm. Antiaircraft artillery is not numerous, has low muzzle velocity, and is either 3-inch or 75-mm in caliber.

Gas equipment is under development. Motor transportation is negligible. The standard transport vehicle is the two-wheeled, 1,000-pound capacity cart, which is excellent for difficult terrain. A few foreign tanks and tractors have been purchased. She has fairly modern and efficient types of bombardment, pursuit, and observation planes.

41. *Training.*—The training of officers is fully equivalent to that in our service. Staff training is excellent. Reserve officers must serve at least one year with the colors before being commissioned. They receive frequent training with active and mobilized reserve units. Enlisted men are thoroughly trained during their 22 months and 20 days with the colors and undergo two periods of training of 3 weeks each while in the reserves. Every reservist has had active training within 5 years.

Training methods are thorough, but not designed to develop initiative. The lessons of the World War are being gradually adopted. Infantry is intensively trained in marching and bayonet fighting, but fires only 150 shots per year. The artillery is well instructed and knows modern methods, but does relatively little actual firing. Cavalry training is thorough, but based on old tactics. Signal communications personnel, while well trained, is so few in numbers that this may prove to be a weakness.

Air service training is not of the highest order, but the Japanese should make good combat aviators and should not be underestimated. The army has between 200 and and 600 trained pilots and can train between 100 and 150 per year.

Army service is not popular, but discipline is strict and morale high. Japanese soldiers will fight enthusiastically in any war.

42. *Reserves of finished munitions.*—Japan is known to have made large purchases of reserve supplies, equipment, and munitions during the last few years. She also has been building up her facilities for manufacturing munitions. She is estimated to have about 5,000 pieces of mobile artillery, between 250 and 500 combat planes,

personal equipment and rifles for 1,500,000, and complete equipment except as noted below for a balanced force of 1,200,000 men. Her reserves of munitions are believed to be sufficient for a force of 1,200,000 men during the period required to pass to war production. This force would be seriously short in light and heavy machine guns, auxiliary infantry weapons, tanks, and airplanes during the early part of a war.

43. *Mobilization.*—Facilities exist for the rapid mobilization of 500,000 to 600,000 men. Mobilization would probably be in two phases. During the first phase her active army and certain auxiliary reserve units will be mobilized, using first reservists. This will probably include an aggregate of about 530,000. All of these units will be well trained, well equipped except as noted above, and ready for combat. The first phase will take about five days. Studies indicate that 450,000 of these can be placed in north China by the twenty-fifth day and the whole force by the thirty-fifth day.

The second phase will probably start on the seventh day. The forces to be mobilized will include 22 reserve divisions and an undetermined number of cavalry, artillery, and auxiliary units. The larger part of these reserve units will be furnished cadres from active units. All will be filled up by second reservists. The units of this phase will probably aggregate between 500,000 and 670,000. The assembly and organization, i. e., the mobilization of this force, can probably be completed by the twelfth to the fifteenth day. It will probably take longer to completely equip it, and many units will probably require additional training before being ready for other than defensive operations. The following is estimated as the rate at which this force will be ready for combat employment:

	Second phase units ready	Total, including first phase units, ready
M plus 15 days	100,000	630,000
M plus 30 days	150,000	780,000
M plus 60 days	200,000	980,000
M plus 90 days	220,000	1,200,000

NOTE.—This leaves 950,000 trained reservists available for replacements or to form additional units.

44. *Doctrines and principles of war.*—The infantry is the arm superior. The following doctrines are ingrained into officers and men: Death is preferable to surrender. Whole units must be sacrificed when necessary. Obedience must be absolute. Victory is won by closing with the enemy and using the bayonet. All commonly accepted principles of war are doubtless known to the Japanese. It is believed that they will especially stress the principles of surprise, the offensive and mobility. Her combined tactics are de-

fective in that they lack a proper appreciation of the effect of artillery fire on personnel and in that battle formations lack depth both in attack and defense.

45. *Prospective changes in situation.*—The reduction of the active army is under discussion. A scheme for reducing the active divisions from 21 to 17, expanding the air service to 12 squadrons, and developing antiaircraft, artillery, tanks, motor transport, and chemical warfare has recently been proposed to the Emperor.

c. *The permanent naval establishment*

46. *Strength and composition.*—The Japanese Navy now consists of the following ships in addition to those being scrapped:

Type	Built	Building	Ordered	Authorized
Battleships	6			
Battle cruisers	4			
Cruisers	6			
Light cruisers	21	6	6	2
Aircraft carriers	1	2		
Destroyers	79	8	2	15
Fleet submarines	[1] 5	14	1	
Other submarines	44		14	
Miscellaneous	227	1		6
Naval transports		11		6

[1] May be more.

Japanese naval personnel is as follows:

	Active	First reserves	Second reserves	Total
Officers and warrant officers	8, 147	1, 355	464	9, 966
Enlisted men	50, 136	20, 430	9, 170	79, 736
Aggregate	58, 283	21, 785	9, 634	89, 702

47. *Organization and distribution.*—The Emperor controls the navy through the Navy Department. This consists of the Ministry of Marine and the General Staff. The latter is charged with matters relating to national defense and to operations. The ministry performs all other functions of a navy department. All naval vessels are assigned either to the combined fleet or to a naval district. The coast of Japan is divided into six naval districts.

When mobilized for war, the combined fleet will consist of the following:

Type	First fleet	Organization
Battleships	6 (2)	2 divisions, 3 ships each.
Light cruisers	4 (1)	1 division.
Light cruiser	1	Do.
Destroyers	16 (3)	4 flotillas.
Aircraft carrier	1	

Type	Second fleet	Organization
Battle cruisers	4 (1)	1 division.
Light cruisers	8 (2)	2 divisions.

NOTE.—Additional destroyer divisions, mine layers, and a submarine division of 6 or 9 submarines and a light cruiser may also be assigned.

Remainder same as first fleet.

Type	Third fleet	Organization
Cruisers	6 (6)	2 divisions.
Light cruisers	4 (4)	1 division.

NOTE.—Destroyers, submarines, torpedo boats, etc., may be assigned to this fleet. Numbers in parentheses indicate ships in reserve during peace.

The details of the assignment of destroyers, submarines, train, etc., are not known. A squadron of gunboats is kept in Chinese waters during peace. The combined fleet is based on the ports of Kure, Sasebo, and Yokosuka during peace.

48. *Characteristics of fleets and ships.*—Exclusive of submarines, whose maximum speeds are from 20 to 22 knots, the first fleet has a maximum speed of 23 to 24 knots and the second of 27.5 knots. While several types of ships have greater radii of action, the radius of both fleets is about 5,000 miles at economical speeds. Light cruisers and destroyers have maximum speeds of 33 to 35 knots. Two battleships have eight 16-inch guns each, with a maximum range of 33,000 yards. All other battleships and all battle cruisers have 14-inch guns, with maximum range maybe as great as 28,300 yards, but is probably considerably less. The battleship armor is from 12 to 14 inches thick, and that of the battle cruisers 8 to 10 inches. Light cruisers now in commission have 5.5-inch guns. Some of those building will have 8-inch guns. They have about 2 inches of armor. Destroyers have 4.7-inch guns. All ships to include destroyers are being given 75-mm. antiaircraft guns. All larger ships carry one or more airplanes and may carry observation balloons.

49. *Training.*—Officer training is equal to that in the army. Officers are deficient in sea experience but otherwise of high professional attainment. The training of enlisted men is thorough. Efficient schools are provided. The volunteers spend 6 years and the conscripts 4 years on active duty.

Naval training is modeled after the British and is deficient only in extended cruising. Morale is high, and the navy as a whole probably is equal in efficiency to any other. Target-practice records

are not known. Naval aviation has a few dirigibles, about 200 trained pilots, and about 200 planes. Its efficiency is equal or superior to that of the army aviation.

50. *Reserves of finished munitions.*—These are ample.

51. *Mobilization.*—The personnel can be mobilized in not over five days. Reserve ships would take longer to shake down. Due to the secrecy that can be maintained in Japan, the first and second fleets could be mobilized and at sea on or within a very few days after the declaration of war.

52. *Doctrines and principles of war.*—Undoubtedly the strategical defensive and the tactical offensive naval tactics are well understood.

53. *Prospective changes in the naval situation.*—Her destroyer, light cruiser, and submarine forces are being considerably augmented. See table of ships supra. Economy measures probably will not decrease the efficiency of her fleet. Japan will comply with her treaty obligations in scrapping old vessels.

d. *The police force*

54. This force consists of about 20,000 men in Korea and 10,000 men in Formosa. It is under civil administration and has various designations. It is of no considerable military value.

e. *Coast defenses and naval bases*

55. *Coast defenses.*—Coast defenses are established to protect the naval bases and principal harbors in Japan proper, Korea, Port Arthur, Formosa, and the Luchu Islands. Fortifications are believed to exist in the Bonin Islands as well. The fortifications in Formosa and the Luchu and Bonin Islands are to remain in status quo under existing treaties. The islands in the Pacific over which Japan holds mandates are similarly to remain in status quo. It is not believed that any of those last mentioned are fortified, although fortifications have been reported at Truk. Extensive mine fields are planned to close the passageways through the Luchu Islands.

Only a few of the most important coast defenses have been provided with 16-inch or 14-inch guns. Japan is planning to strengthen her coast defenses further as funds permit. No other permanent fortifications are known to exist.

f. *Naval bases*

56. Japan has three splendid fleet bases in home waters—Kure, Yokosuka, and Sasebo. These are excellently equipped. Subordi-

nate fleet bases for operations in the Sea of Japan exist at Maizuru and Chinkai. There are torpedo bases as Ominato and Oshima in home waters and at Bako and Truk in outlying possessions. Bako and Trnk can be used as fleet bases for short periods. In addition there are moderately good harbors in the mandate islands which can be used as destroyer and submarine bases. A few divisions of heavy ships could also be based on these harbors. Amami-O-Shima has a fine harbor and could be made into a valuable fleet base. Some facilities also exist at Port Arthur and Yeiko (Korea).

B. POTENTIAL MAN POWER AND PROBABLE RATE OF DEVELOPMENT IN WAR

g. *The population*

57. The population of the Japanese Empire is estimated to be 80,640,000. This includes Japan proper, Korea, Formosa, and Saghalien. The population of Japanese mandates and leased territory is about 934,000. About 481,000 Japanese are living in other foreign territory.

The total population subject to Japanese control, including Japanese living abroad, is about 82,000,000.

58. *Political and racial factors.*—There are approximately 59,000,000 Japanese within the Empire, 166,000 Japanese in Japanese mandates and leased territory; including Japanese living abroad, the total Japanese population is 59,740,000. The Japanese are extremely patriotic. They can be relied upon to support their Government in time of war. Those within the Empire and within Japanese mandates and leased territory may be considered as available.

There are 21,400,000 Koreans, Chinese, and Formosans within the Empire and 722,000 Chinese and Koreans in Kwantung and south Manchuria. There are 51,000 natives in the mandate islands. These elements can not be relied upon to support their Government in time of war. While they may furnish aid in the form of labor and supplies, they may, if a favorable opportunity occurs, rebel against the Government.

59. *Sex.*—Within the Empire 50.5 per cent of the total population are males. Within leased territory and mandates and Japanese populations living abroad 60 per cent of the total Japanese population are males.

60. *Males of military age.*—About 13.2 per cent of the total male population of Japan come within the ages 17 to 45.

61. *Males physically fit.*—Males of military age physically fit are approximately as follows:

(*a*) Within the Empire: 7,060,000 Japanese and 2,560,000 Koreans, Chinese, and Formosans.

(*b*) In mandates and leased territory: 23,000 Japanese and 92,000 Chinese, Koreans, and others.

(*c*) Living abroad: 70,000 Japanese.

62. *Men for essential industries.*—To provide for essential industries about 1,000,000 men should be deducted from the total males of military age physically fit for military service.

63. *Potential man power of Japan.*—The potential man power of Japan is approximately 6,083,000, plus such man power as she may obtain from the Korean, Chinese, and Formosan population under her control. Under favorable conditions the Koreans, Chinese, and Formosans may rebel, in which case a deduction should be made for suppressing this rebellion.

64. *Military and education training.*—Of the 6,083,000 men available only 2,000,000 have received military training. Japan has excellent public schools, and all Japanese are required to take the lower primary courses. A smaller number take high-school courses and only a small per cent college courses.

65. *Recruitment and training facilities.*—The regular army is well trained and well adapted to expansion. Mobilization plans have been prepared since 1908 and revised each year. The draft machinery is well organized and equipped and has had long experience and practical experience each year. The regular army, consisting of 250,000 men, can be expanded within 21 days to a force of 1,200,000 men and its training completed within three months. The same establishments can mobilize and train approximately 600,000 additional men every six months.

66. *Political and economic factors.*—Except for the Korean, Chinese, and Formosan elements there are no political factors which may hinder the development of the man power of Japan. These elements are not included in the reliable man power of Japan.

Japan has equipment and ammunition for a force of 1,200,000 men and plants and resources available for maintaining that force in the field. For a larger force additional plants will have to be installed. It will probably take two years to provide additional equipment and ammunition for an additional force of 3,000,000 men.

67. *Transportation facilities.*—Japan has sufficient transportation to place a force of 1,200,000 men in Korea in about 90 days, or a force of 500,000 in the Philippines in about five months.

(IV) CONCLUSIONS OF THE COMMITTEE

1. By virtue of her geographical location and physical geography the Japanese Empire has extraordinary strategic defensive strength, except against an approach from the Asiatic shore.

Her vital areas are her communications with the Asiatic shore, and include Korea and the sources of her importations in China and Siberia. Her transportation is sufficient to permit her to ship troops to the Philippines at the rate of 200,000 men per month and to Asia at the rate of 500,000 men per month in addition to handling her economic needs.

2. That her internal political conditions are such as to make it possible for her to engage in a serious and prolonged war, but that her foreign relations and treaty obligations are such as to make it improbable for her to engage in such a war during the next 10 years unless her position on the mainland of Asia is threatened.

3. Her financial stability is dependent upon her foreign trade. The bulk of this trade is with the United States and Great Britain. Therefore a war with either would result in serious financial derangement and probably destroy her credit abroad.

4. Japan can be self-sustaining in food in time of war with reasonable system of rationing.

5. With free access to the coast of Asia Japan could maintain her necessary war industry indefinitely. Without this access she would collapse.

6. Her permanent army, active and reserve, is well trained and efficient. It can be mobilized and ready for combat at approximately the following rate: 530,000 by M plus five days, thereafter at about 220,000 per month until her maximum regular army strength of 1,200,000 is reached. Equipment is modern and sufficient, except for shortages in automatic and auxiliary infantry weapons, tanks, and airplanes. Reserves of munitions are probably sufficient to maintain this force until war production can start.

Her navy consists of six battleships, four battle cruisers, and a high percentage of light cruisers, destroyers, and auxiliary service, and is well trained and efficient. It is probably equal, ship for ship, to other navies. It can be mobilized and at sea on M day.

7. The potential man power of Japan is estimated to be about 6,000,000 men. The rate of development for maximum effort depends upon the supply factor. It would probably take 18 months to 2 years to increase her initial force of 1,200,000 men to a force of 4,000,000 men.

8. That in case of war with the United States, Japan would probably seize the Philippines and Guam and then assume the strategic defensive.

H. I. J. M. SUBMARINE NO. 69

One 4.7", six 21" tubes. Japanese official displacement 665, but it is believed the correct figure is considerably over 1,000. Speeds unknown. Alate type, completed April, 1924

JAPAN

GRAND MANEUVERS

September, 1924

[From the Japanese press]

The imperial navy's grand maneuvers will be conducted for three weeks, commencing October 2, 1924. This was officially announced by the navy authorities. The Prince Regent is to inspect the maneuvers when the opposing squadrons meet in the final action in maneuvers near Kure Naval Station.

Admiral G. Yamashita, chief of the General Staff, was appointed commander in chief under the Prince Regent. The offense squadron is to be headed by Admiral K. Suzuki, commander of the combined squadrons, and the defense squadron is under the command of Vice Admiral H. Saito, commander of the second squadron.

The judges appointed by the Navy General Staff include Admiral K. Okada and Admiral K. Ide, members of the High Military Council; Vise Admiral S. Momotake, commander of the Maizuru Naval Station; Vice Admiral S. G. Saito, vice chief of the Navy General Staff; Rear Admiral H. Yamamoto, president of the naval college; Rear Admiral T. Tosu, member of the Navy General Staff; Rear Admiral Usakawa; and Rear Admiral K. Seki.

The squadron to take the offensive will consist of the major portion of the combined fleet, and a special unit is to be organized as the defensive squadron. Almost all of the entire fleet of the imperial navy will engage in the coming maneuver, and in consequence a special coast defense corps has been organized at Kure, with Capt. J. Takahashi as commander, to prepare for any possible emergency.

Schools of the various naval units in Japan headed by the Naval Staff College in Tokyo will be closed during the three weeks of the maneuvers and the faculties and students are expected to attend them, following the tactics with close interest.

It is not known generally just what naval strategy will be tried out in the maneuvers. However, it is reported Japan's imaginary enemy is expected to attack Kyushu Island first with a squadron coming by way of the Hawaiian Islands, the Philippines, the Straits Settlements, and Formosan Sea.

The maneuvers will be arranged to prepare against such a style of attack, it is said, and further plans are being made to cover attacks on the main island through Bungo Strait, the narrow waterway between Kyushu and Shikoku Islands, and by way of the Inland Sea.

The plan is understood to be to permit the invading warships to come up to Huga Strait, off Kyushu, where they will be destroyed by the defensive squadron waiting at a certain naval base facing the Pacific, awaiting for an opportunity to annihilate the enemy.

An aerial attack is reported to be expected along the Kyushu and Shikoku coasts, and this also is being taken into consideration. The direct attack of an imaginary enemy, it is believed, is impossible on the main island from Hawaii by warships, but an aerial raid from enemy airplane carriers is quite possible when these boats draw near Japan's coast on the Pacific.

Strategy against naval attacks from Hawaii as a base is disregarded in the maneuvers, it is said, for the authorities believe the most logical plan of attack would favor coming in through the Kyushu and Shikoku waters and along the southwestern coast of Japan facing the Pacific.

The ships participating in the maneuvers are to assemble at their assigned places by September 30. The places at which they are to assemble and the organization of the forces are as follows:

Blue Force (attacking), to assemble in Hiroshima-wan as follows:
- First Fleet: Admiral Suzuki, commander in chief.
  - First Division: Admiral Suzuki, commanding. *Nagato, Mutsu, Yamashiro, Hyuga.*
  - Third Division: Rear Admiral Osumi, commanding. *Isuzu, Tama, Yubari.*
  - First Destroyer Squadron: Rear Admiral Nakamura, commanding. *Tenryu* (flagship of squadron).
    - Sixteenth Division: *Nos. 10, 12, 16, 18.*
    - Fifteenth Division: *Tsuta, Hagi, Susuki, Fuji.*
    - Fourteenth Division: *Tanikaze Kawakaze, Aoi, Kiku.*
    - Thirteenth Division: *Nos. 2, 6, 8.*
  - First Submarine Flotilla: Rear Admiral Imaizumi, commanding.
    - *Jingei* (tender).
    - Fourth Division: *Nos. 28, 29, 30.*
    - Sixth Division: *Nos. 46, 47, 57.*
  - Special Service Division:
    - *Tokiwa* and Mine Sweeper Division.
  - Airplane depot ship: *Hosho.*
- Second Fleet: Vice Admiral Kato, commander in chief.
  - Fourth Division: Vice Admiral Kato, commanding. *Kongo, Hiyei, Kirishima.*
  - Fifth Division: Rear Admiral Otsuka, commanding. *Yura, Natori, Nagara, Sendai.*
  - Second Destroyer Squadron:
    - *Kitagami* (flagship).
    - First Division: *Namikaze, Yamakaze, Nokaze, No. 1.*
    - Second Division: *Okikaze, Sawakaze, Minekaze, Yukaze.*
    - Fourth Division: *Hakaze, Tachikaze, Hokaze, Akikaze.*
    - Fifth Division: *Nos. 3, 5, 7, 9.*

Blue Force (attacking)—Continued.
Second Fleet—Continued.
Second Submarine Flotilla: Rear Admiral Kawai, commanding.
Hirato (flagship); *Chogei* (tender).
Twenty-sixth Division: *Nos. 59, 72, 73.*
Fourteenth Division: *Nos. 45, 58, 62.*
Submarine *No. 44.*
Airplane depot ship: *Wakamiya.*
Temporary airplane depot ship: *Takasaki.*
Tanker, food-supply ships, miscellaneous ships.

Red Force (defending), to assemble in Ise-wan. Temporarily organized for the maneuvers.
Third fleet: Vice Admiral H. Saito, commander in chief.
Second Division: Vice Admiral Saito, commanding. *Ise, Fuso.*
Sixth Division: Rear Admiral Uchida, commanding. *Iwate, Nisshin, Kasuga.*
Seventh Division: Vice Admiral Furukawa, commanding. *Yakumo, Asama Idzumo.* (Training squadron.)
Eighth Division: Rear Admiral Matsumura, commanding. *Kinu, Oi.*
Ninth Division: Rear Admiral Kanesaka, commanding. *Yahagi, Akashi.*
Third Destroyer Squadron: Rear Admiral Shirane, commanding. *Kiso* (flagship).
Thirteenth Division.
Seventeenth Division.
Eighteenth Division.
Twenty-fourth Division.
Fourth Destroyer Squadron: Rear Admiral Otani, commanding. *Tatsuta* (flagship).
Twenty-fifth Division.
Twenty-sixth Division.
Twenty-seventh Division.
Twenty-eighth Division.
Third Submarine Flotilla: Rear Admiral Nagano, commanding. *Aso* (flagship). *Manshu* (tender).
Twenty-second Division.
Twenty-fifth Division.
Temporary airplane depot ship: *Sata.*
Special service ships.
Miscellaneous ships.

The following is a translation of a reply to a request made to the Japanese Navy Department regarding the grand maneuvers:

(1) The period and work of the grand maneuvers.
(*a*) First stage of the maneuvers. October 2 to 12.
Individual training.
Preparation for action.
Replenishing stores.
Defending against aerial attacks and various other aggressive and defensive maneuvers on a small scale.
(*b*) Second stage of maneuvers. October 13 to 24.
The Blue and Red forces will oppose each other, principally in the waters south of Honshu.

(1) The period and work of the grand maneuvers—Continued.

(*a*) First stage of the maneuvers—Continued.

When this is over, most of the forces will assemble at Sasebo, where the reviewing of the various stages of the maneuvers will be read by the grand inspector.

(2) Various divisions participating.

(*a*) Oversea divisions:

The combined fleet (first and second fleets).

The Training Squadron, and *Fuso*, *Ise*, *Kirishima*, *Nisshin*, *Kasuga*, *Iwate*, *Oi*, *Kuma*, *Kinu*, and other ships in commission and in reserve class, numbering:

6 battleships.
3 battle cruisers.
37 other war vessels.
97 destroyers.
35 submarines.
15 special service ships.

(*b*) Land divisions:

Land divisions belonging to Yokosuka, Kure, Sasebo, Ominato, and Bako. (Most of the ships attached to Kure, Bako, Sasebo, and Ominato will not participate in the second stage of the maneuvers.)

(3) The above-mentioned divisions are divided into the Red and Blue fleets. The Blues will assemble at Kure and Hiroshima-wan by October 2, while the Reds will assemble at Ise-wan. Ships attached to naval stations will assemble at their respective station and will commence the maneuver from the 12th.

JAPAN

KASUMIGAURA NAVAL AIR TRAINING STATION

September, 1924

A visit was made to the Kasumigaura Naval Air Training Station on the morning of March 31 to make arrangements for the storage and care of supplies which are being shipped from Yokohama. Lieutenant Nagai of the army accompanied me. We were met at Tsuchiura Station by Lieut. Sabro Yamaguchi, a naval officer, who escorted us to the aerodrome. There we met Commander Wada, second in command; Commander Kuwabara, in command of the seaplane station; and Lieutenant Yamada. The admiral commanding the station was absent. Lieutenant Yamada and Lieutenant Yamaguchi are the two officers who have been assigned to visit the Kurile Islands on board the American destroyers. The problem of receiving the supplies and transporting them from Tsuchiura to the station, a distance of about 3 miles, was discussed with these officers, and it was finally decided that Commander Kuwabara would take care of the supplies and, if necessary, open up the boxes of wings and propellers and store them in the proper manner. By the time

these arrangements were made it was 12 o'clock. Commander Wada invited us to luncheon at the officers' mess. After luncheon a visit was made, in company with Commander Kuwabara and Lieutenant Yamaguchi, to one of the large storage hangars on the land aerodrome to see if there was sufficient space for the storage of the large crates, such as pontoons, wings, etc. We found this building very satisfactory. It is a large steel and brick building, approximately 200 feet long and 100 feet wide. It is designed expressly for the purpose of storing airplanes and spare parts.

We next visited the seaplane station and looked over the hangars and slipways, with a view to determining whether or not they were large enough to house the Douglas cruisers. While visiting this station Commander Kuwabara explained to me the system of training used at the present time. The course lasts one year. The first three and a half months all officers undergoing training are taught to fly Avro training planes. These Avros are two-seated biplanes equipped with 80-horsepower LeRhone engines. These planes were made in England by the Avro Co., and are considered to be very efficient training planes. At the present time there are 40 students undergoing training on these planes at this station. At the end of three and a half months' training on Avros the students are divided into classes. One class begins advanced training on seaplanes and flying boats; the other class begins training on pursuit, reconnaissance, or torpedo planes. These three types are all land machines. The seaplanes used for the advanced training are of Japanese manufacture. They are two-seater biplanes equipped with 200-horsepower Hispano-Suiza engines. These engines are made in Japan also. They have two floats of very heavy construction, which seem to be excellent for that type of training. I was told that these seaplanes are of a design 6 years old and that no more of them are being manufactured. As soon as the planes now in use are worn out a new type, or rather an improved type, will be used. One of this type was being hauled into the water during this visit, and I had a very good opportunity to observe its general lines. It is approximately the same general design as the one just mentioned and equipped with the same motor. I was not able to observe any distinct improvements over the old type. Several Avro seaplanes were also used in training. These are the same as the land machines, except that they are equipped with pontoons instead of wheels. The officers when asked about the 200-horsepower Hispano engine said that they did not like them because they were not reliable. This seems to be the general opinion of this engine wherever it is used. The main trouble lies in failure of the reduction gears. We have experienced in the United States this same trouble when using these machines in Spad pursuit planes.

The seaplane station consists of six temporary hangars. These hangars have wooden frames which are covered with canvas. The station has been constructed about two years. There are three concrete slipways running from in front of these hangars to the water. There are several small office buildings and storage houses, all of wooden construction. At present there are two steel hangars under construction; that is, the steel girders are on the ground ready to be erected, and it is expected that they will be completed within one month. They have several large steel and brick hangars to house airplanes, a two-story permanent administration building, a permanent repair shop and machine shop, and there are now being erected two large steel masts for a high-power wireless station. There is also one large balloon hangar, but I do not know what it contained. The flying field itself is excellent. It is about a mile and a half square and very smooth. There is no grass or sod of any kind growing upon it. Most of the airplanes at this station are Avros, as already described. However, in addition to these, there are a number of pursuit planes. These are evidently a training type and look very much like the old Thomas Morse scout which we used for training during the war, except that they are equipped with 300-horsepower Hispano engines. I saw several of these flying and they did not appear very fast. I should say that their maximum speed was about 120 to 130 miles an hour. However, they are very solidly constructed and seem to be very sturdy machines. The torpedo planes are biplanes with about a 65-foot wing spread and are equipped with 450-horsepower Napier Lion engines. I saw several of these flying and they appear to have a speed of about 85 to 90 miles an hour. I have no idea of their weight-carrying capacity. However, I should say that they were designed to carry at least one naval-type torpedo. All of the hangars that I visited were well stocked with new machines which had not been set up. Evidently they do not intend to purchase any more foreign-made airplanes. The general design of all of the types of Japanese-made planes that I observed seemed to be a mixture of French, British, and German. The fuselage in front of the fire wall on all of the types of Japanese-made airplanes is constructed of tubular steel with welded joints. This method was first used by the Germans and has now been adopted by almost every other country. I noticed that some of the planes had fuselages entirely constructed of steel tubes. However, the majority had wooden longérons. The engines were installed in the fuselages in such a manner as to be readily accessible.

Commander Kuwabara told me that the present system of training was going to be discontinued in the near future, and instead of teaching students to fly land machines first, they were going to teach

them to fly seaplanes first. This is the system used in the United States. Officers undergoing advanced training on pursuit, reconnaissance, or torpedo planes are being trained to fly these types from the deck of airplane carriers. I was told that they had not been very successful in landing the torpedo planes and reconnaisance machines on the decks of carriers, but that they experienced no difficulties with the small pursuit machines. All instruction is done in the morning—there is no flying in the afternoon, except for the purpose of testing or experimenting.

JAPAN

MISCELLANEOUS NAVAL NOTES

September, 1924

[From the Japanese press]

The second fleet, headed by the *Kongo* and *Hiyei*, left Kure on the morning of September 26 for Mitsugahama, Province of Iyo, where shore leave will be granted before the maneuvers, and the fleet will be back again on the 28th.

The first fleet, headed by the *Nagato*, *Mutsu*, *Hyuga*, and *Yamashiro*, arrived in Kure on the 26th and began preparations for the grand maneuvers. The fleet will leave Kure on the 30th for Tokuyama to refuel and then proceed to the base for the maneuvers.

The temporary organized third fleet, headed by the *Ise* and *Fuso*, will leave Kure on the 28th for Ise-wan.

Ten airplanes, consisting of four reconnoitering planes, three battle planes, and three torpedo planes, left Kasumigaura for Yokosuka on September 24. They are on their way to participate in the grand maneuvers.

The *Aki* was sunk outside of Tateyama in Tokyo Bay September 6, 1924. The Prince Regent viewed the bombardment, which preceded the sinking of the ship, from the deck of the *Kongo*. The *Kongo* participated in the bombardment with about 50 other ships.

Repairs to the *Adzuma*, which went aground, are nearly completed and she is to be used as a training ship at Maizuru in place of the *Kasuga*.

The laying of the keel of the *Nachi* has been delayed. The *Nachi* was to be laid down on the building ways of the *Akagi*, but owing to the delay in the launching of the *Akagi* the laying down of the *Nachi* will be delayed.

The *Akagi*, which is being converted into an airplane carrier at Kure and which was to be launched in January, 1925, will not be launched until the end of 1925 on account of a reduction in the naval appropriations.

The *Kuki*, of the Twenty-sixth Destroyer Division, while participating in maneuvers in Bungo Channel on the night of September 16, collided with a sailing vessel. The destroyer sustained damages on her starboard side aft. She proceeded to Kure immediately, where she will undergo repairs.

The work of enlarging the conning tower of submarine *No. 56* was recently completed, and she was taken out on September 13 for trials. As she was about to dive, filling her forward trim tank, she suddenly inclined forward, almost vertically, and was about to go down, but this was prevented by pumping the water out of her tank. The submarine was not under way at the time the experiment was tried, but it is believed she would have been lost had this experiment been tried while under way.

The accident appears to have been due to loss of balance between the conning tower and the trim tank on account of the enlargement of the conning tower to twice the original size. Further tests will be made, and if it is found that the fault is due to the enlargement of the conning tower same will be reduced to its original size. If this is found necessary, she will not be able to participate in the grand maneuvers.

Submarine *No. 44*, which recently made a continuous high-speed cruise of 300 miles from Saiki-wan to Tateyama is, in connection with the grand maneuvers, to make another long cruise southward without being accompanied by a tender. She will go to Tateyama on September 25 to refuel and then to Kure, leaving Kure October 2 for coast of Taiwan, touching at Keelung, Tansui, Amping, Takao, and Bako, a distance of about 1,000 miles. She will undergo various tests during the trip.

On account of the unsettled conditions around Shanghai, the *Tsushima* and *Saga* will be sent to reinforce the ships now there. The *Tsushima* will leave Sasebo on September 15, and the *Saga* is expected to leave on the 18th.

There are now at Shanghai the *Tatsuta*, *Tone*, *Hira*, and *Hotsu*, and there will be six ships when the *Tsushima* and *Saga* arrive.

It has been definitely decided to build the engineering school at Maizuru Naval Station. The school is expected to be opened in April, 1925.

GERMANY

ANTIAIRCRAFT MEASURES OF THE NAVAL CORPS IN FLANDERS

[Translated from the German press]

General.—Unrestricted submarine warfare against trade commenced in 1917. In a few months it attained the importance of a decisive factor in the war. As was to be expected, the enemy replied by strong offensives against the Fourth Army, which protected the sea bases on the Flanders coast. The outcome was the Battle of Flanders, which started with extensive operations in the air, increasing in intensity all through the battle. After the collapse of the enemy's offensive on land the attacks by air increased still further, attaining their culmination point in the summer of 1918. Here, on the north wing of the western front, measures were taken to fight a decisive battle in the air for the domination of a portion of the sea, the progress and full meaning of which are of special interest as touching similar combinations in a future war. The headquarters command of the naval corps had made extensive preparations in good time. With the steadily growing success of the submarine war the supreme army command also soon became convinced of the correctness of the demands made, and promised to render every possible assistance. Notwithstanding all elaborate preparations, the strength of the aerial forces employed by the enemy in time probably exceeded every conception and all expectations. Nevertheless the enemy left us a few months' time to elaborate our measures of defense. By so doing he enabled us to stave off, for the time being at any rate, an adverse decision against us.

The preparations.—German preparations for aerial warfare comprised the reorganization and augmentation of the sea and land planes, and in combining the various sections of antiaircraft artillery under one command as the antiaircraft forces of the naval

corps. Up to the beginning of 1917 antiaircraft operations by artillery was one of the duties of the artillery regiments. Now four groups were formed:

1. The coast group, with batteries from St. Paul to Mariakerke, which again was subdivided into two subsidiary groups, Zeebrugge and Ostend. Tactically the batteries of the army antiaircraft gunnery school in and round about Blankenberghe were attached to them. Divisional commander: First Lieut. of Reserves of M. A. Hoffmann at Zeebrugge.

2. The Bruges group, which from a tactical point of view soon developed into the focal point. The naval antiaircraft battery at Ghent was part of its organization. Divisional commander: Lieutenant J. N. R. of M. A. Hollweg at Bruges.

3. The west group with front toward Middelkerke-Lombardsyde-Dixmuiden, at times augmented by an army antiaircraft artillery group, and always held by naval and army batteries. Divisional commander: Lieutenant J. N. R. of M. A. Reymann at Ghistel.

4. The Bavarian antiaircraft machine-gun division No. 3. Owing to conditions at the front less capable of independent action than others, yet this division performed excellent services in cooperation with antiaircraft guns and aviators in the intelligence service and in the training of machine-gun crews. At times it was successfully employed in combination with other sections as an infantry machine-gun force on the land front. Divisional commander: Captain Bösmiller at Stalhille.

We get an idea of the rate of development of this service when we look at the available artillery park in active service at the front (15, 12.5, 10.5, 8.8, 7.7, 3.7 cm. guns); in 1917, about 70; in 1918, about 212. To these must be added kites and balloons at about 120 flying stations, mainly round about Bruges and subordinated to that group. Kites and balloons were not nearly so much in evidence at the locks at Zeebrugge, and were little used, at the request of the seaplane pilots.

The extension of the intelligence service proceeded hand in hand with the augmentation of fighting material, the reliable and quick working of the former being a matter of supreme importance in aerial warfare. Each battery was furnished with two to three observation stations, fitted with the best optical and acoustic instruments. They were dispersed all over the country, wherever possible combined with searchlight stations, toward the enemy and on the frontiers numerically as strong as possible, and fitted with their own widely extended net of telephone connections. Their reports were collected in three central aviation intelligence stations, sifted and arranged, and passed on to threatened points, last of all to head-

quarters at Bruges. By this means danger was best averted and cooperation of all concerned assured. The searchlights were combined into groups of three to four and were not tied to any one particular position. The leading searchlight of each group was intrusted with the duty of announcing the direction in which the enemy was advancing, and the duty of the others was the illumination of the targets. The batteries were furnished with the very best measuring instruments and partly with shooting appliances for antiaircraft guns. Batteries in fixed positions were mostly commodious, well-concreted outfits with fixed positions for the guns. Movable, i. e., interchangeable, positions were only provided for in the west group, where occasional very heavy enemy artillery fire made such an arrangement necessary. The guns from 7.7 cm. downward naturally made the very best possible use of their mobility, likewise the 8.8-cm. railway-truck guns. As regards the remainder, the good but heavy artillery, and also the nature of the objects to be protected, made fixed positions for the guns an absolute necessity.

Permanent theoretical and practical courses of instruction looked after the training of the personnel. They were also regularly attended by men of the fleet and from home and also at times from our allies. Lively intercourse with the army antiaircraft gunnery school led to exchange of experience. But the best teacher of all was the enemy with his never-ceasing activities. When in the summer of 1917 he began to become a heavy burden, the strength of the force had been built up to about 50 per cent of the ultimate strength in view.

Up to then the focal point of the fighting on land at Ypres had acted like a magnet on the bulk of the enemy's aerial forces. The French aviators, who were not much feared, soon disappeared from the coast entirely and were replaced by the far more resolute and indomitable English. Imbued with extraordinary personal bravery, the English air forces also endeavored to adapt themselves materially to the new measures of defense adopted by us. The excellent de Haveland and Handley Page planes soon doubled the altitude to which they were able to rise to avoid or diminish the danger zones. That fact apparently put an end to kite and balloon barrages. In actual fact it protected the objects surrounded by them against attacks by low-flying planes, which are by far the most difficult to fight against. The increased altitudes of enemy planes, however, benefited us also, as they reduced the difficulty of aiming at quickly moving targets, and as a result the work of the antiaircraft guns as regards time and stability, observation, and steadiness of aim, improved. On the other hand, the artillery lost in breadth of range

what it gained in height, and that meant increasing the number of guns. It had to be done, however, and the Admiralty in the end voted, before it was too late, that which the supreme army command could not grant, although many a time a hard battle with pen and ink had to be fought to get it. Before long the enemy presented us with new bombs of great explosive power and considerable weight.

Thus on both sides the year 1917 was chiefly notable for increase of material for aerial warfare. On the other hand, one could not as yet discern anything in the nature of aviation tactics, properly so called, on the enemy's part. The enemy made good use of flying weather, tried to get at the target, but, as a rule, promptly cleared off without reaching it when he got within range of our artillery fire. He evidently still lacked ingenuity to sidetrack our measures of defense. In the tactical race we were just about a head's length ahead of him. This proportion naturally was fraught with the danger of our settling down into a groove. But we were not kept waiting very long; an impulse, suggesting the advisability of keeping awake and progressing, came very soon.

Tactical developments.—In keeping with the tactics of the enemy, measures of defense were very simple at first: In the daytime and by searchlight firing at visible targets, and when all was dark blockading fire at various altitudes over the object to be protected. In all these the great speed of the moving targets called for intensive fire in sudden bursts.

In the scientific and practical development of antiaircraft gunnery distingnished services were rendered by the Chief Adjutant, First Lieutenant of Reserves of M. A. von Sanden, who was at one time professor of mathematics at the University of Gottingen. Of convincing lucidity in speech and in his writings, and himself deeply imbued with the correctness of his methods, he earnestly but yet also with a spirit of humor faced all the manifold difficulties that had to be dealt with, assiduously teaching and instructing, and well versed in all the phases assumed by criticism. The point was to adequately express in the simplest form of a military command the four elements which were constantly influencing each other, namely, altitude, distance, vertical and lateral deviation. The latter was not really satisfactorily achieved until the year 1918. The high rate of speed of 40 to 70 m sec. at which the targets were moving, and the free tridimensional mobility of the same, preclude all possibility of rectifying fire. The natural dispersion of barrels and fuses permits and favors the abandonment of graduated ranges. Hence the method adopted—a volley fired at command by batteries of as many guns as possible; two or three volleys in quick succession; waiting for result of lateral observation; and with corrections accordingly a new sequence of volleys, assuming, of course, a high

velocity of the projectile and absolutely reliable fuses. In practice it was at times found to be a good plan to have the fire under dual control, one officer giving altitude and range, another altitude and lateral correction. This method permitted of many variations and was used together with single control: the nature of the work in hand called for quick adaptation to conditions as they presented themselves: hard and fast inflexible rules were out of place.

Basing its methods upon the experience gathered by the force as a whole under all sorts of conditions, the leaders of the antiaircraft forces gradually confined themselves to restricting the latitude allowed to the batteries, and so were able to build up useful practical rules.

Blockading fire was developed on similar lines. The aviator, invisible in the darkness, was only discernible to the ear. Consequently the opening of blockading fire always depended upon the individual faculties of the observer at the object of attack. The bulking together of bursting shells, fire distribution, and fire discipline were matters under the control of the group or divisional commander. The success of antiaircraft measures was at all times, but especially at nighttime, in a very great measure dependent upon harmonious cooperation between batteries, intelligence and searchlight service, both in the sector and throughout the force all along the line. The more promptly and accurately the local command was notified of the approach of the enemy, the greater the chances of success of the measures of defense. At the same time it was necessary to refrain from excess of zeal in transmitting reports and not to be too lavish in sounding the alarm. Bruges and the coast in 1918 had to repulse a bombing attack about once every two hours if flying weather was favorable, and unfortunately that was the case almost all the time. On the other hand, our own aviators were out and at work at the same time, so that the demands upon the antiaircraft service were extraordinarily heavy. The outcome was that quite a number of specialists grew up, specialists in seeing, hearing, and distinguishing, specialists in location and in grasping the situation, all of which could only be achieved by absolute devotion to the work and training of men and officers. Before long the Bruges section became the standard by which the others were measured. Although the other groups contributed a considerable share, yet the highest praise is due to the divisional commander at Bruges, Lieutenant J. N. R. of M. A. Hollweg. Sure and quick in decisions and always on the spot, he had the knack of imparting his own knowledge and views to every one of his subordinates and to raise up and maintain a high standard of ambition and sense of duty in an admirable manner.

A much more thankless and difficult task was the work on the coast. To set out advanced outposts on the water was useless. The motion of the sea, wind, and ships' engines interfere with sight and hearing. Observation close inshore was subject to practically the same disturbances. The coast line therefore was always more exposed to surprises than the other positions, a hint not to build valuable factories, etc., near the coast. What the coast lacked in warning reports it had to make up for in superior vigilance and preparedness. It fully came up to expectations and all demands made upon it. That is evidenced, among others, by several important happenings in the spring of 1918. A few days before the British attempt to blockade Ostende and Zeebrugge the aviation intelligence of the group reported that the suspicious movements of English aviators in the early dawn appeared to point to some very special operations about to be carried out. The attack that followed was recognized by the coast group first of all, which gave the alarm to the shore batteries, and on the mole at Zeebrugge successfully attacked the English landing troops with machine guns and hand grenades. When shortly afterwards H. M. the *Emperor* inspected the field of action, an enemy bombing plane, unobserved, joined our own scouts. Recognized by the antiaircraft guns at Zeebrugge in the nick of time and fired upon with effect, the enemy plane dropped its bombs a few hundred meters away from its target.

A few weeks previously Zeebrugge had the good fortune to bring down the English squadron leader, Lieutenant Colonel X. This brave and energetic leader was doubtless the life and soul of the English air force and the originator of the enemy's bombing tactics which were such a source of trouble for us. It was he who organized and trained the daylight massed attacks with 30 to 70 bombing and fighting planes. These swarms, subdivided into groups of three or four planes each and flying in formation at different altitudes, maneuvered with extraordinary skill and made the best possible use of every aid to surprise attacks, such as twilight, light, ground fog, low-lying tumbled clouds, advance over the sea, etc. After the bombs had been dropped the fighting planes descended to low altitudes and attacked living targets and inflammable buildings with machine-gun fire and incendiary bombs. Each new form of attack was first tested by the leader himself. Thus, for instance, he had made up his mind to destroy the locks of Zeebrugge. At early dawn 5,000 m. up above the point of the mole, he descended, gliding at top speed to 50 m. over the canal and the locks in the belief that with such a surprise every attempt at alarm must fail. He paid for his first attempt by being shot down, was wounded, taken prisoner, and sent to one of the hospitals at Bruges. Intercourse with this intrepid and chivalrous opponent soon assumed almost friendly

forms, and with his retirement from active operations tactical development on the enemy's side came to a standstill.

The batteries of the west group were frequently exposed to heavy fire, a sign how unpleasant their activities were to the enemy. Thus, for example, in the summer of 1917 five (it is true, very far advanced) batteries in fixed embrasures were shot entirely to pieces within 10 days, and covered with about 2,000 shells of heavy and heaviest caliber every day. They were reestablished more to the rear under great difficulties. Quick-firing guns and machine guns remained behind close to the enemy's lines to keep off planes attacking the trenches, and also the advanced observation stations to keep them company. About 2 to 3 km. to the rear followed the horse-drawn army batteries and to the rear of them the naval batteries in fixed positions. With plenty of fighting going on all the time the observation and intelligence service proved a very valuable adjunct in forming opinions on the general tactical position. A specialty thought out and worked by a Belgian aviator was very disagreeable for a long time—namely, firing from captive balloons. These balloons sailing fairly low down and making full use of illumination, hollows in terrain, farm buildings, groups of trees as camouflage, made 8 to 10 successful attacks. Finally, after exhaustive experiments and preparations, in which the Bavarian machine-gun section also took part with good effect, he was successfully driven off by means of "fire screen" and ultimately shot down in descending. The courageous leader escaped wounded, and, by the way, a short time afterwards wrote us a post card, expressing his appreciation. As far back as the winter of 1917–18 the commander had felt it his duty to train and prepare the officers by giving them practical problems to solve. Theoretical results and practical experience over and over again culminated in a demand for a combined fighting organization with the fighting airplanes. Close cooperation according to a prearranged plan promised to be a successful proposition. The new chief of the air forces and the squadron leaders fortunately appreciated the arguments advanced in favor of such a combination and promised open-hearted support.

The guiding principles which were worked out by both branches had for their object the entangling of the enemy in combat in the air according to predetermined plans, and to provoke or force an aerial battle on a large scale. The most satisfactory and successful outcome was the constant intimate cooperation, the playing into each other's hands, perfect in operation in every detail, of intelligence, aviation, and antiaircraft gun service. Active participation of commanders and officers on both sides in everything connected

with the solving of the problems in hand, in experiments and reconnaissance flights, tended toward the maintenance of mutual understanding, interest, and, not to be despised by any means, a feeling of comradeship. Prevailing conditions, more or less permanent, in the naval corps favored cooperation of this kind. Under other conditions and in mobile warfare (as opposed to position warfare) such results can only be achieved if all antiaircraft forces of a general command are united under *one* chief command.

The tactics of the enemy's night-flying planes centered first of all upon attempts to reduce the effect of our blockading fire. Four to six planes carefully circled round an object singled out for attack, drew the blocking fire by feigned rushes, and attacked immediately *after* the fire wave, during the listening interval, or dropped their bombs *during* the fire on some other unprotected object in the vicinity. As the dexterity of the searchlight crews increased, these tricks of deception no longer worked, and the enemy thereupon favored the much more unpleasant tactics of exhaustion. Isolated big bombing planes, sailing along one after the other in marching order, kept the alarm going for hours on end, gradually collected at the attacking point, and then suddenly advanced to the attack in mass formation. This led to combined night antiaircraft measures by aviators and antiaircraft guns. At intervals of about 10 km. from the main object of attack (Bruges) the foreground was divided into sectors, distinguished by electrically illuminated direction and signposts and searchlights. In each sector, when called upon, one or two "C" planes patrolled the ground at a low altitude when the enemy's approach was reported. Without having searchlights trained upon it, but located by its position to the illuminated signposts, the enemy plane was in danger of being outlined against the sky and recognized by the defending plane flying beneath him. With searchlights the chances of being able to attack the enemy plane increased considerably. The first experiments after lengthy exhaustive preparations, in which the commanders took part personally, already led to a complete success—two big bombing planes of 30-m. wing spread were shot down.

Although this may have only been a lucky chance, yet the enemy felt the blow severely, and for some time gave up night attacks, and fitted himself up with dazzling lights which were to act as a light screen between himself and the antiaircraft defenses. The means were as yet imperfect, but nevertheless were well worth noting and thinking about.

When matters had reached this interesting stage further progress was stopped by the sudden order to retire. A good deal of the valuable material was fitted up in and round about Antwerp, and on November 9 it was handed over to the enemy. We had looked for-

ward with perfect confidence as to what the outcome of the war would be.

In the years 1917 and 1918 it is proved that more than 400 enemy aviators were shot down in North Flanders; 133 of these were credited to the antiaircraft artillery and the rest to the fighting airplanes. Approximately 100 were brought down by the guns in 1918.

In conclusion, the question remains to be answered, to what extent the enemy's aerial attacks were successful, and to what extent they influenced the operations in Flanders and at sea. The enemy's aerial attacks undoubtedly called for a considerable increase in the quantity of antiaircraft material, which Germany had to provide, but they were not able to seriously affect our conduct of operations in Flanders, let alone to act as a deterrent in operations at sea. The shipyards, depots, locks, and other plant in connection with naval warfare were on no occasion seriously damaged, nor was it ever necessary to suspend work in them. The loss of men on the German side was inconsiderable; the victims among the enemy population of the occupied territory, especially in Bruges, probably amounted to a few hundred. The last-mentioned fatalities practically ceased altogether as soon as a sufficient number of dugouts, cellars, etc., had been provided as shelters for the population against bombs, and once the people had learned to take cover in them in good time. All that was achieved, therefore, in the way of material results by the big-scale enemy bombing attacks was the destruction of a goodly number of old houses near the yards at Bruges.

SPECIMEN RECORD OF ANTIAIRCRAFT OPERATIONS AT NIGHT NEAR BRUGES

August 18. Weather clear. Wind power 2. Moon rises 11.30 p. m.

A. BRUGES CENTRAL STATION

P. M.

7.00—Report from Ghent: German fighting units, night flights. Pass on to groups and batteries. Order for groups; report to aerodromes: 10 p. m. wire protection, standing as high as possible.

9.00—Report from Ghent: Start between 9 and 10 o'clock. Aviation fires on coast burning from 9.20 until further orders. Pass on to groups and aerodromes. To aerodrome Stalhille: Night antiaircraft planes ready to start from 10.00.

9.30—Report: Wire screen standing, altitudes over 1,700 m. can not be reached owing wind high up. Balloons, as no ground wind. Pass on to groups and aerodromes.

B. FIRING LINE, BRUGES GROUP

10.20—Report from aerodrome Stalhille: Four "C" planes ready to start for antiaircraft operations.

10.30—Report from west, central station: Enemy aviators audible, direction Dixmuiden, about 3,000 m. up. Pass on to aerodrome Stalhille.

10.31—Report from Ghent: Fighting squadron started direction coast. Pass on to groups and batteries.

10.33—Report from Thourout: Enemy aviators audible over Dixmuiden, about 3,000 m. up.

10.34—Report from Stalhille: Two "C" planes started direction Dixmuiden. Two "C" planes starting at once, direction Nieuport.

10.36—Report from west, central station: enemy aviators south of Ghistel, 3,000 m. up.

10.37—Report from Thourout: Enemy aviators over Thourout, 3,000 m. up, direction Bruges.

10.38—Order: Searchlight Group I permission sweep Thourout.

10.40—Observation: Searchlight Group I lighting up. Order: Alarm! Blockading fire I position "high," direction yard, railway antiaircraft guns and Lophem Artillery Depot. Report from Ostcamp: Own aviators audible direction Ghent toward coast.

10.43—Observation: An enemy big bombing plane in searchlight, battery Lophem and railway antiaircraft guns get on the target.

10.44—Report coast: Enemy aviators audible seaward Bredcene.

10.46—Order: Searchlight Group II get on target. Observation: Antiaircraft guns Andreas fire at target.

10.48—Searchlight Group II lighting up. Searchlights Zeebrugge lighting; fire at target at Zeebrugge. Order: Searchlights Group I dim lights. To observation at yard: Permission for blockade fire.

10.50—Observation: Blockade fire yard. Blockade fire Zeebrugge.

10.53—Report from St. Paul: Enemy aviators from Holland 2,500 to 3,000 m. up, direction Bruges. Order: Searchlight Groups III and IV permission sweep direction St. Paul. Report from Stalhille: Own aviators over Stalhille, direction Ostend. Observation: Bombs dropped direction yard. Order: Blockade fire stop!

10.55—Observation: Searchlight Group IV lighting up. Report from Damme: Enemy aviators audible direction Damme-St. Croix, 2,800 m. up. Observation: St. Croix fire at target. Order to observation at yard: Permission blockade fire. Observation: Blockade fire at yard.

10.56—Observation: Bombs dropped direction yard. Order: Blockade fire Stop!

10.57—Order: Inner searchlights screen. Observation: Bombs dropped direction artillery depot. Order: Searchlight Group I light up artillery depot!

10.58—Observation: Searchlight Group I lighting up: has got on target; antiaircraft guns Lophem fire at target. Railway antiaircraft guns likewise. Target covered.

11.02—Batteries cease firing.

11.03—Report Stalhille: "C" plane attacking. Pass on to batteries and searchlight Group I.

11.05—Order: Alarm back, preparedness for alarm!

11.09—Report: A heavy bomb, yard entrance south; electric cables damaged, no losses. Twelve bombs outside yard, to the west; eight to ten bombs outside yard, east of canal. One bomb in town south of yard; one house destroyed; several Belgians wounded and killed. Two bombs railway east of artillery depot: no damage. Weight of bomb about 200 kg.

11.16—Report of batteries on ammunition used. St. Croix: Two aviators in searchlight, well covered, one of them very shaky, after third volley veered off seaward. Lophem: One enemy aviator well covered. St.

Andrée: One plane well covered, pressed hard, after second volley veered off seaward. Stalhille: Approached up to 150 m., when searchlight lost the target, fired about 20 rounds machine gun. Enemy damaged, apparently turned off southward.

11.18—Report from coast: Enemy aviator, apparently damaged, about 1,800 m. flying away seaward. Stalhille: All "C" planes landed, four ready to start.

SPAIN

A DISCUSSION OF CONDITIONS IN GENERAL

September, 1924

(By an officer who has recently spent a number of months in travel and observation about the Peninsula)

On the 13th of this month (September) the Spanish Military Directorate completed the first year of its rule, but the day was not one for the Government to celebrate, because the occasion found the head of the Directory, Gen. Primo de Rivera, in Africa with a Spanish Army of about 200,000 men, literally with their backs to the sea, facing an embattled line of Moorish tribesmen, who, numbering a scant 13,000 or less, had driven the Spaniards into two towns on the coast and had cut off all communication with the few outlying small posts still held by the nominal rulers of that part of Morocco. The story of how Spain has come to such an ignominious position is a most interesting one, but this writer is not sufficiently familiar with it to tell it all here; he hopes, however, to convey a rough idea of the situation.

The roots of the present deplorable situation go back to the development in Spain of the centralized absolute monarchy, which began in the reign of Charles II in the sixteenth century. Prior to that time Spain had enjoyed a very full measure of local government, and the Spaniard of to-day is quick to remind the visitor that the constitution of Aragon is older than the Magna Charta. At the time when the small Christian States on the shores of the Bay of Biscay were uniting and beginning their war on the Moors, which culminated in the capture of Granada in 1492, the Spanish cities of the north had a measure of self-government comparable to that of the famous city States of Italy and Germany. The "Comuneros," who opposed the centralization of authority in united Spain, rose in revolt in 1520, but were unsuccessful, and thereafter from that time down to the last century all power rested in the sovereign, and the country was ruled by a succession of royal ministers who gave Spain the distinction of having the worst government in the world. Only one able monarch held the throne during the past four centuries, Carlos III, who aided the American colonists in our war for

independence. His son and successor handed over Spain to Napoleon, and the Spanish war for independence, which followed, ushered in a century of civil strife.

Spain finally emerged with the outward symbols of a constitutional monarchy, but in point of fact the people had merely changed one despotism for another. Accustomed to several centuries of exploitation at the hands of those who held the reins of power, the country accepted more or less calmly the replacement of one set of grafters by another. The new régime played the last acts in the loss of the great Spanish colonial empire, and naval officers will recall that the cruiser *Cristobal Colon* had no large guns when she faced our fleet at Santiago—the money appropriated for her main armament had gone elsewhere.

In 1902 the treaty of Algeciras partitioned Morocco, giving France a large "mandate," Spain a smaller one, to the north of the French portion, and making Tangiers an international city. In the 22 years that have elapsed since that time, Spain has never succeeded in establishing control over the territory allotted her. Naturally, the principal reason for this situation is the failure of the Government to seriously undertake the project. It is true that the Government has repeatedly gone through the motions of settling the matter, and troops have been poured in and sacrificed, but money has never been used for proper equipment and supplies. Huge sums of money have been appropriated for this purpose and every peseta has been spent, but not on ammunition, supplies, and equipment.

About three years ago the Spanish Army in Morocco suffered what was described as a "great reversed"; actually it was simply a massacre. In July, 1921, the Riff chieftain, Abd-el-Krim, made an attack on the Spanish positions, which was startling in its fury and which was so successful that in a very few days the Spaniards had lost practically all the territory that it had taken them 12 years to win. The Spanish force had consisted of 25,000 men, while the Moors did not number over 4,000, and they claim to have had only 2,000 men in action. The Spaniards were so poorly provided with supplies, especially ammunition, that the action could not properly be termed a battle. It became a headlong rout, in which the brother of Primo de Rivera, a colonel who had served with great distinction, was killed. The Spaniards took refuge in an old fortification on the coast, Monte Arruit, and later, acting under orders from Madrid, surrendered. In defiance of the terms of the surrender the Moors killed every enlisted man and carried the officers off as prisoners. Despite protests from the army, who knew that the money would be expended for more ammunition to use against them, the Government ransomed the captured officers by the payment of more than 4,000,000 pesetas.

This writer was told by the Madrid correspondent of a great London paper, and also by a very able American correspondent, that the Spanish soldiers of to-day are fine fighting stock, and their appearance would bear out this opinion. Spain theoretically has compulsory military training, but, under the political governments which preceded the Directory, exemption was simple. But the troubles of the army in Morocco are very simply analyzed. To begin with the politicians regarded the whole question of Morocco from a personal political standpoint—that is, they desired to use it for political purposes, and never had a sincere wish to settle it. Secondly, the war against the Moors was always conducted with a view to the possible graft for friends and retainers which it might be made to furnish and always was made to furnish. Thirdly, graft and political pull were rampant within the army itself. The natural and inescapable result was that the army's rations were very, very poor, when they were not actually putrid; the supplies of equipment were insufficient and of poor quality, and ammunition always short. In addition to these things, the direction of the army in Morocco has been very poor, and the organization still is one which does not take into account the mission to be performed.

After the terrible tragedy in 1921, even the politicians began to say that the matter should be investigated and that responsibility should be fixed and the guilty punished. The investigation, however, became political in character, and although some officers were punished for their share in the catastrophe, it was apparent that the intention of the investigating committee, which the Congress of Deputies had appointed, was to make political capital, to blame the army and pass over the graft and inefficiency in the Ministry of War, and also, possibly, to attempt to fasten part of the blame on the King. These facts had much to do with the decision of Primo Rivera and his associates to cast out the politicians.

The proclamation of Primo Rivera is an interesting document; a virile document, from which some extracts are worth quoting:

> This is a movement organized by men; he who does not feel his masculinity sufficiently strong let him wait in his corner and not disturb in any way the bright days which we are preparing for our country.
>
> These are the reasons which justify our act:
>
> Assassinations of prelates, of ex-governors, representatives of authority, masters, foremen, and workmen.
>
> Scandal of wasted millions.
>
> Suspicious fiscal and customs policy, the work of people who openly boast of their political immorality.
>
> Miserable political intrigues under pretext of the unhappy tragedy in Morocco.
>
> Social indiscipline, which renders work inefficient and null, and agricultural and industrial production both precarious and ruinous.
>
> Communist propaganda, which goes on unchecked and unpunished.

Prevailing impiety and lack of culture.

Justice under the influence of politics.

A bare-faced separatist policy in Catalonia.

The exhibition of biased political passion in facing the question of the responsibility for the disasters in Morocco.

We have not come to cry out over our ignominy and shame, but to apply a prompt and radical remedy.

* * * * * * *

The collective responsibility of the political parties we punish by that complete ostracism to which we condemn them.

The complete and instantaneous success of Primo Rivera in securing the support of public opinion was due to the fact that the Spanish people agreed with every word of his proclamation, and while past history has made them less ready to accept panaceas than we are, still they all felt that it was impossible for conditions to be made worse.

Of course, the politicians who were thrown out of office feel that the world is all wrong, that the ideals of democracy have been outraged, and that the salavation of the country depends upon their return to power. Nobody in all Spain, except those who have suffered by the economical zeal of the dictator, sheds any tears over the plight of the politicians, but in truth it is a sorry one.

One of the first acts of the directory was to suspend sessions of the parliament, which was then in recess. The Spanish Cortes had become a well-managed institution, and, of the 409 seats in the Congress of Deputies the ruling clique held two hundred and sixty-odd. Count Romanones, who has been Prime Minister a number of times, has five sons—they were all deputies: he has two sons-in-law—both senators: he has three private secretaries—they were all either senators or deputies. The Prime Minister deposed by Primo Rivera has no sons, but he has two sons-in-law—both deputies: three nephews—two of them deputies and the third an undersecretary: he is himself a lawyer, and five other members of his firm are either deputies or ministers. Such instances are the rule with the politicians.

Primo Rivera came to power with no previous experience in government, and his associates in the Directory—all generals except Admiral Magaz—were equally inexperienced. The president of the Directory, General Rivera, and the vice president, Admiral Magaz, have repeatedly stated in speeches that they and their associates realize their inability to execute the governmental functions as they should be performed, but that they are giving Spain an honest government and doing their best, and that if the people have patience the final result will be of benefit to the country. Primo Rivera recently replied to some criticisms that he had no intention of defending the acts of the Directory, that he knew that mistakes had

been made and he expected to make some more mistakes, but that he and his associates were doing their best for the good of the country, and that he believed that the people generally are approving of their efforts—which is unquestionably true.

The press of Spain is generally hostile to the new government and is only prevented by a military censorship from airing that hostility daily. Some Americans have shown a tendency to condemn the Directory on this ground alone, and they say, "Nobody knows what is going on; things must be bad or they would not conceal what they are doing!" Theoretically this sounds very logical and convincing, but actually there is more to be said. In this country and in Great Britain a free and independent press is the principal safeguard of the Constitution and the rights of the people, but Spain has never been fortunate enough to have such a power for good and honest government. Under the old régime the newspapers were directly subsidized by the Government, and every newspaperman of any importance held several of those convenient posts under the Government by virtue of which he drew a nice, fat salary and never went to the office. No actual censorship existed in those days, but it is safe to say that no minister or other high Government official was ever offended by anything he read in the newspapers. Practically every newspaperman in Spain is poorer to-day than he was before Primo Rivera became so well known, and this fact may have something to do with the attitude of the press.

But the real problem which confronts the dictator is the question of Morocco. Primo Rivera was removed from a military position he held under a former government because he had openly expressed the belief that it would be best for Spain to abandon Morocco altogether. This is the opinion that almost every American comes to after a little study of the matter, and in saying that all Morocco is not worth the lives and money it is costing the general shows that he is an independent and progressive thinker. But as actual head of the Government he finds the proposition of letting go a trifle difficult. There are factors to be considered before the correct and logical course can be adopted. First, the jingoes all over Spain would bewail the loss to Spanish prestige, and would maintain that the name of Spain had been disgraced forever, that the men who had died in Morocco had been betrayed, and so forth. Second, there is, unfortunately, a large clique within the army itself which is determined for personal reasons that the war shall go on. These officers will probably assassinate Primo Rivera if he attempts an early withdrawal from Morocco. Third, there is a class outside the army enriched by their profiteering in army supplies—and they are making heavy weather now—but they are determined to overthrow Primo Rivera, and equally determined that the war must never end.

Fourth, there are in Morocco a number of Moorish tribes which have long aided the Spaniards. To these natives withdrawal would mean complete annihilation, if they are left in Africa.

There are many true stories of the personal bravery of Primo Rivera, and there can be no question that he knows that the probable end of the Directory will come with a bullet through his heart. Yet, he is carrying on, and has probably survived this first year because of his genuine contempt of fear. When the general was to visit Africa in July, the Associated Press correspondent in Madrid told me in advance that he would probably be killed. Primo Rivera took with him only one aide, and that saved his life on the two occasions on which men actually drew revolvers and told him that his time had come, because in both instances others interposed and said, "We must not murder an unarmed and unprotected man."

Every Spaniard believes that France has covertly aided the Moors continually. It is also widely believed that England has encouraged the Riff chieftain in his recent activities. While neither of these assertions is susceptible of definite proof there is much evidence that such is the case. The Moors have carried on an almost continuous war against the Spaniards for years, during which time they have been well supplied with equipment of all kinds and have exhibited splendid leadership. The Spaniards have repeatedly captured French officers among their prisoners, but when these captures have been reported to the French Ministry of War, the ministry has invariably replied that the men in question are deserters. Apparently, the French have considered it good policy to prevent the Spaniards from gaining control of their territory, and hope that the Spaniards will ultimately become discouraged and withdraw, thus leaving the field free for the French to absorb practically all of Morocco. Long ago the French converted their protectorate into what might be described as a part of France itself. Great Britain has not looked with favor on the French bid for all Morocco, and it seems that the recent activity of the Riffs has been encouraged by a promise from London of the recognition of a Riff republic, which would include practically all of Spanish Morocco except the extreme western part.

Despite the fact that it is well known that Primo Rivera wished to withdraw from Morocco, and that he was seeking for some method of doing so, which might avoid wrecking his Government or causing a rebellion in the army, the Riffs launched an offensive against the Spaniards in the latter part of July this year. According to reports, they inflicted considerable losses on the Spaniards and recovered a great deal of ground. Primo Rivera was compelled to send reinforcements into the fighting zone from Spain, and went there himself to assume command. It has been openly stated in news dispatches to various American papers that the Riffs are counting on

British recognition of their republic as soon as they proclaim it. About two weeks ago dispatches from Europe indicated that the Spanish positions in Morocco were insecure, but there has been no news since.

According to well-informed persons, the Spanish Army on 1 July, 1924, consisted of about 220,000 men with a trained reserve of about 1,176,000 men, of whom nearly 100,000 were on active duty for training, giving Spain about 320,000 men under arms, including 8,000 Moroccan native troops. In June this army was divided about equally between Spain and Africa, but at the time of the Moorish offensive in July considerable reinforcements were sent across the straits so that the forces in Morocco now number about 200,000 men. With the reductions in the naval budget for the current year the number of enlisted men in the Spanish Navy will be reduced to 14,000. The budget reductions will also involve the placing out of commission of several vessels.

On the whole the economic condition of Spain is fairly good, and bids fair to improve. The Spaniards are buying a great many articles from the United States, with automobiles probably heading the list. Spain made considerable money during the war, but not as much as she would have made had her manufacturing establishments been better equipped and her railroads in better shape for handling the volume of business. German money poured into Barcelona hindered production at the source, but the lack of equipment of the railroads was a large factor. The Spanish railroads were built under a franchise which provided that they should become the property of the State after 100 years. When the war came on, these franchises had less than 30 years to run, and the railroads found it impossible to borrow money for necessary rolling stock and improvements. The politicians in the Government failed to do anything until the war was over, when they did provide for a Government equipment loan. The railroads are in fair condition to-day, but in their present status it is difficult to see how anything can be done for them. If the shadow of approaching Government ownership were removed, the Spanish railroads should prosper.

It is difficult, if not impossible, to arrive at a proper estimate of Primo Rivera and his associates. One hears conflicting stories and opinions, but on the whole, after asking many questions and talking with many people, this writer is convinced that the Directory has already accomplished several good things, and they have begun a number of other measures which are undoubtedly for the good of Spain. In the Saturday Evening Post, under dates of December 1, 8, and 15, 1923, Mr. Frederick Britten Austin had a series of articles on the subject which were very interesting. These articles

were written within a month of the "Revolution" and are well worth reading.

Politicians in France, who have not looked with favor on the events of the last few years in Italy and Spain, have taken the lead in stirring up propaganda against Primo Rivera. Sometime this summer the Literary Digest made the flat unquoted statement that "Primo de Rivera is driving all the intellectuals out of Spain," following with a long wail from a French paper about the banishment of a former professor of the University of Salamanca who had written a vicious attack on the King and published it in a paper in Argentina. This man was the only so-called intellectual who was banished, and since then a general amnesty has been proclaimed. All of the college professors, and others, who believe in the debating form of government, have been greatly outraged in their feelings by the very thought of Primo de Rivera. Every practical man or woman who talked to this writer during three months in Spain agreed that Primo de Rivera has done and is doing a great work for real democracy in Spain, even though he makes no speeches that would appeal to the "Liberals." An Englishman who has been 10 years in Spain said that Government graft has permeated the whole social and business structure of Spain, and that by cutting off this graft at the roots Primo de Rivera had given Spain a new lease of life. In considering the whole question it is ridiculous to compare Spain and Spanish conditions with the United States. The countries are totally dissimilar in so far as their governmental problems are concerned, although the logical result of increased Federal meddling in the United States would be to produce a situation similar to the bureaucracy which the Spaniards have gotten rid of.

Primo de Rivera and his Government have actually accomplished these things:

1. Immediately after taking office he began to reduce the Government pay roll, and within a short time he had dropped 35,000 civil employees who never went to their offices, except perhaps to draw their pay. He began at the top by dismissing all the ministers and undersecretaries and by abolishing their offices. He kept up a steady thinning of the bureaucracy.

2. When he came into office the Government faced a deficit for the fiscal year 1923–24 amounting to 1,000,000,000 pesetas. Two and one-half months of the year had elapsed, but by the end of the year he had practically balanced the budget. He has effected enormous savings, and the budget for this year is much smaller. Although a military directory is in power, appropriations for both the army and navy have been reduced. The peseta is below par, but it is higher than European exchange in general.

3. A royal decree has been promulgated which provides a much greater measure of self-government for the various Provinces of the Kingdom. Every effort is being made to decentralize the Government.

4. Government graft of all kinds has been eliminated as far as possible, and every effort is being made to end all kinds of graft within the Kingdom. Great progress has been made, but this goal can not be attained at once.

5. Crime has been greatly reduced. Communists left Barcelona by the hundreds when the Directory was established. Barcelona's murder record has almost vanished.

6. In his proclamation to the people on September 13, 1923, the dictator promised a civil government under military protection as soon as practicable. The foundation for this is being laid in the formation of a new political party called the Union Patriotic. No politicians of the old days are to be admitted and the old parties are not permitted to gather.

7. Primo de Rivera came into power by the simple expedient of publishing a proclamation which told the truth about the politicians No shots were fired, no troops were used. Several politicians fled when they heard the proclamation, and the ministry resigned when the King declined to arrest Rivera. It is needless to say that the vast majority of the country approved of Primo Rivera—without that support he could not last overnight.

Many well-informed observers say that the monarchy has played its last card. Primo Rivera may be killed any day, but if he is given time he will do a great deal for Spain.

UNITED STATES

AIR SERVICE

September, 1924

(A discussion prepared by a committee at the Army War College)

A. 1. *Introductory statement.*—Marshal Foch stated in 1921 that "The potentialities of aircraft attack on a large scale are almost incalculable, but it is clear that such an attack, owing to its crushing moral effect on a nation, may impress public opinion to the point of disarming the Government and thus become decisive."

Surprise and freedom of movement are preeminently attributes of the Air Service and, with the increase in range, carrying capacity, speed and general efficiency, together with actual growth in numbers and potentialities of production, imply that, at the outbreak of war, whole fleets will be available for offensive operations.

Air Service consists of:

(*a*) Air Force, an independent striking air force.

(*b*) Air Service proper, a tactical force operating with ground troops.

Development of air communications by commercial aviation is the basis of successful military air development, for at the outbreak of war all civilian planes and personnel will be at once placed on a military status.

2. *Types.*—Aviation divides its planes along the following lines, according to the use to which they are put:

Pursuit; this is the fighter type, speedy, easily maneuverable plane.

Observation: this is the reconnaissance plane.

Bombardment: this is the bombing plane.

Attack: this is the armored plane for attacking ground troops.

3. *Accomplishments.*—The following actual accomplishments of the Air Service are listed:

(*a*) The daily performance of our Air Mail Service well illustrates the reliability and dependability of the Air Service.

(*b*) Speed: A speed approximating 100 miles per hour or over can always be assumed as practicable.

(*c*) Carrying capacity: Types of airplanes have been developed carrying 2½-ton bomb load: 25 infantrymen, arms and equipment.

Flying boats of from 10 to 15 gross are in actual operation.

4. *Altitude.*—Pursuit planes capable of climbing to 20,000 feet in 20 minutes are in use. The altitude records with superchargers are 36,555 feet for airplane and 29,462 feet for seaplane.

5. *Range of action.*—Planes are now being constructed for bombardment purposes which have an endurance of 12 hours and a range of action of 550 miles and return without landing.

6. *Results of actual tests.*—(*a*) The *Virginia* and the *New Jersey* were sunk by airplane bombs; in the case of the *New Jersey*, eighteen 600-pound bombs were dropped between 10,000 and 11,000 feet with four direct hits; seven destructive hits out of the 18 bombs dropped; these ships were anchored.

(*b*) The Royal Air Force bombed the *Agamemnon* from a height of 8,000 feet scoring 2 direct hits and 10 within 20 feet of the target. This ship was radio controlled and was steering a zigzag course.

(*c*) Planes have recently flown around the world, although with practically ideal conditions of supply.

(*d*) Recent tests in the Hawaiian Department indicate bombing planes are more accurate than seacoast guns at ranges between 25,000 and 30,000 yards and over.

7. *Lighter-than-air craft.*—From results of tests so far made, the air authorities seem to agree:

(*a*) Captive balloons are valuable for the regulation of artillery fire and general observation.

(*b*) Rigid airships are valuable for long-range scouting, especially with a fleet, in both cases with the proviso that they must be properly protected by friendly aircraft.

B. 1. *Conclusion.*—A consideration of the foregoing leads to the conclusions that the powers of the Air Service in war in its present stage of development are:

(*a*) Its quality of surprise action is unquestioned.

(*b*) Its mobility is beyond question.

(*c*) Its speed and range permit of almost instantaneous combinations to fight with power to live dispersed.

(*d*) Its destructive effect through the use of bombs is very great. This effect is not only on matériel, but also on personnel and morale.

(*e*) In artillery preparation it can replace long-range artillery.

(*f*) It is dependable from the standpoint of operation, provided there are sufficient spare planes and maintenance facilities available.

(*g*) It will place all naval craft in great jeopardy unless this craft is adequately protected by aircraft.

(*h*) Its attack on all objectives must be reckoned with when these objectives are within bombing distance—at least 550 miles.

(*i*) The armament and speed of attack aviation are such that it is enabled to attack troops on the ground.

(*j*) Its powers of reconnaissance and observation are unquestioned.

A consideration of the foregoing leads to the conclusions that the limitations of the Air Service in war in its present stage of development are:

(*a*) Its effectiveness is impaired by weather and lack of visibility.

(*b*) It is vulnerable to hostile aviation and antiaircraft agencies.

(*c*) It is dependent almost entirely upon land bases in overseas operations.

(*d*) Concentration of effort by an air force is limited in the case of overseas operations, due to the fact that it is impossible for aircraft in sufficient numbers to take the air from floating bases at the same time.

(*e*) The radius of action (endurance) of pursuit and bombardment aviation must be brought more nearly together, i. e., bombardment planes should be under the protection of pursuit planes at all times; now after one and one-fourth hours they are unprotected.

(*f*) Delicate mechanisms are a source of weakness. Both planes and engines are of comparatively delicate construction and constant care and labor are necessary to keep them in an efficient condition.

(*g*) Necessity of especially highly trained personnel.

(*h*) Bombardment aviation can not operate safely at low altitudes over areas protected by effective antiaircraft fire.

(*i*) Bombardment aviation can not obtain good accuracy when bombing small objectives on dark nights.

(*j*) Bombing and observation aviation can not maintain an effective defense against pursuit aviation for indefinite periods or with any except highly trained and experienced personnel.

(*k*) Antiaircraft artillery on land is a thoroughly effective means of defense against the bomber, provided it is available in adequate quantity and that searchlights and listening apparatus are capable of detecting and illuminating the targets.

(*l*) A sufficient supply of complete planes and spare parts for the planes in use must be available. (This is most important.)

(*m*) Lighter-than-air craft are extremely vulnerable to hostile aircraft and antiaircraft agencies.

C. 1. Data bearing on the subject of the comparison of the strength of leading powers—France, Italy, Great Britain, Japan, and the United States—with incidental data on Germany and Russia.

This subject is considered in detail under the following heads: Personnel, equipment, organization, airways, appropriations for aviation, aeronautical industry.

1. *Personnel.*

	Officers and men, actual flyers	Total strength of air force
France	16,980	33,400
Italy	1,550	9,000
Great Britain	2,820	32,000
Japan	1,700	11,000
United States (all services)	7,100	23,702

Aviation strength of all the above nations is increasing annually except that of the United States.

France has a reserve of 3,000 civilian pilots.

Italy is training 100 pilots per month.

Great Britain expects to increase her total personnel 4,000 by 1925. Her system of schools is noteworthy.

Japan has a comprehensive school system already established. Some of her units have been abolished in order to provide aviation personnel.

United States: In 1923 the combined output of R. O. T. C. and flying cadets was 5 per cent of the annual requirements. The commissioned force is now 177 short of the authorized strength.

2. *Equipment.*—Omitting balloons and dirigibles from the list.

	Land planes	Sea planes	Planes on order	Carriers in service	Under construction
France	4,158	50	600	0	1
Italy	950	200	400	1	1
Great Britain	1,080	120	668	3	3
Japan	600	200	500	1	2
United States	1,034	425	252	1	2

France has a tremendous aeronautical industry which will enable her to keep pace with the air program of any nation.

Italy is gradually, but surely, putting her equipment on an efficient, satisfactory basis.

Great Britain's air program provides for an increase to put her equipment on a reasonable standard as compared with that of France.

Japan has the most modern equipment of all the countries under consideration. It is unequaled in quality by that of any other country. Her pursuit planes are the equal of any in existence.

United States: Assistant Secretary of War Davis stated, in October, 1923, that in 1926 there would be a shortage of 1,468 planes in those needed by our service.

This condition, even though funds become available, cannot be remedied before 1927, as quantity production can not be assured before that time.

3. *Organization.*—By the end of 1925 France will have 196 squadrons (6 to 12 planes) with 100 per cent reserve equipment.

Italy: By June 30, 1925, Italy plans to have 115 squadrons (10 planes).

Great Britain: 70 squadrons (12 planes) are authorized with increase equivalent to 13 squadrons by January, 1926. Her organization is being rapidly perfected to conform to her special needs for home defense.

Japan: The latest information indicates 40 squadrons of 10 planes each.

United States: Organized 48 squadrons, but all undermanned and underequipped.

4. *Airways.*—France leads all countries both in military and commercial airways.

Italy: The development of her airways is progressing.

Great Britain has completed her airways.

Japan has a complete system of military airways connecting insular and mainland possessions; her commercial airways are in process of development.

The United States: Notwithstanding the systems established by the Army and Air Mail Service, the country is deficient.

5. *Appropriations.*

	France	Italy	Great Britain	Japan	United States
1921	14	3.25	99.5	21.5	53
1922	32	5	90	21.5	32.5
1923	49.75	13	90.5	34	27.5
1924	50	17.5	94.25	23.75	27
1925		22.75	86	26.25	27.5

Comparison is made of the same periods as nearly as possible: amounts in millions of dollars.

Appropriations of France, Italy, and Japan are growing, while those of Great Britain and the United States are apparently stabilized with Great Britain three times that of the United States.

6. *Aeronautical industry.*—The real index of air power lies in immediate aircraft production capacity. France easily leads all nations in the production of aircraft and its domestic supply of raw materials will enable her to maintain this position for some time to come. Factories can produce 500 planes per month, with a tremendous increase possible.

Italy: Her factories can produce 100 planes per month.

Great Britain: The present output is 20 per month, but can easily be expanded. Her policy is to put her air strength on par with that of France. This will produce an enormous expansion.

Japan has 12 plants, employing 6,500 men to-day: the production is 43 planes and 50 engines and motors per month. This production can be expanded three times in the case of planes, and many times in the case of engines and motors.

United States: Her military demand can not be met at the outbreak of war and quantity production can not be obtained until a considerable period of time has elapsed.

Based on present conditions of aeronautical industry, the relative standing of the countries listed is France, Italy, Japan, Great Britain, and the United States.

7. *Remarks relative to Germany and Russia.*—Germany: In spite of the regulations imposed by the treaty of peace, the nucleus of airplane activity remains, and furthermore is active: there are actually 25 manufacturing concerns in being. The technical staffs of many of these concerns have opened up branch factories in other countries; but it must be remembered that these concerns are still essentially German. Italy, Holland, Denmark, Finland, Latvia, and Switzerland, as well as Russia, all have German manufacturing establishments that are producing planes. The airways of Germany

are organized, and by 1926 it is proposed to have Germany united with all Europe and parts of Asia in a system of airways.

In connection with German air power, note is made that the Zeppelin Works at Friedrichshafen are still in existence, and that they have just manufactured the rigid airship (*ZR–3*). Attention is also drawn to the fact that the Zeppelin interests are now united with the Goodyear interests in the United States.

Germany's aircraft industry is not dead.

Russia: The air strength of Russia is problematical.

At the end of 1923 the Red air fleet consisted of 432 planes fully equipped, 60 per cent pursuit, balance training, reconnaissance, and bombing machines.

Trotski's plan is for 5,000 planes. A later plan contemplates 1,150 fighting machines by January, 1924, and 2,000 active and 250 reserve machines by January, 1925. There are six airplane factories in Russia, but their real value is not known. The expenditures for aviation in 1923 were $18,540,000.

D. *Conclusions.*—A consideration of the foregoing leads to the conclusions that:

(*a*) The United States is backward in practically all important aviation factors which together constitute air power. It is only in the efficiency of personnel, individual achievement, training, and especially in the field of mechanical development within the Air Service that the United States stands at the top.

(*b*) In numbers, considering the relative air problems presented the different nations, the United States stands last.

(*c*) In equipment suitable for immediate combat the United States stands far behind. Much of the United States equipment is obsolete, except for training purposes.

(*d*) Organizations are not ready for field service, due to insufficient personnel and equipment.

(*e*) Progress is being made in construction of airways in the United States, but much remains to be accomplished.

(*f*) The air industry of the United States, through lack of Government orders and lack of commercial demands for aircraft, is in a condition of impotence.

(*g*) Japan to-day far excels the United States in air power and by 1926 will be so far ahead as seriously to imperil the United States in the western Pacific.

(*h*) The ranking of the world's powers to-day is France, Japan, Italy, Great Britain, United States.

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OFFICE OF NAVAL INTELLIGENCE
NAVY DEPARTMENT
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MONTHLY INFORMATION BULLETIN

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DECEMBER, 1924

DISTRIBUTION

In general: Bureaus of the Navy Department; all force commanders; all commanding officers of capital ships, the larger patrols, destroyers, and submarines

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FOR CONVENIENCE IN ROUTING

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Third Division Officer			
Fourth Division Officer			
Fifth Division Officer			
Marine Officer			

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The material for the Bulletin is largely derived from service sources and its interest and value are correspondingly dependent upon the number and character of the reports received by the Office of Naval Intelligence from our own officers. In this connection the observations of officers afloat are of great value, particularly if the reports rendered are drawn up in accordance with existing intelligence instructions.

While political and economic information is undoubtedly of much use, the collection of military information should come first in the intelligence work of cruising ships.

GREAT BRITAIN

FAIREY AVIATION COMPANY

October, 1924

This plant now employs 1,500 men instead of 1,300. The technical staff has been increased from 51 to 70. The plant itself is being expanded by the addition of a new steel building approximately 75 feet wide and 200 feet long. This building will be used for all experimental construction. A complete inspection of the works was made, and it was obvious that the plant was operating to its full capacity. The airplanes under construction were "Flycatchers," of which there were eight on the assembly floor, 3–D's, of which there were seven on the assembly floor, and one experimental 2-seater reconnoissance airplane. It was stated that the order for 50 "Fawns" had been completed and that an order of 60 3–D's had been increased to 100. The number of "Flycatchers" on order could not be ascertained. Mr. Fairey remarked in the course of a conversation that his plant was now doing more than 50 per cent of the total aviation construction in England. It was noted that no "Flycatcher" Amphibians were on the floor of the assembly room, and when questioned in regard to this Mr. Fairey stated that he was not entirely satisfied with that type, and added that, although it had gone through both the experimental and development tests, it had not yet been adopted as a service type. In this connection it was noted that the "Flycatcher" land planes are now being equipped with air bags for emergency flotation. These air bags are made of what appears to be balloon fabric and are located three of rectangular shape directly behind the pilot's seat and two of special curved shape to fit in the fuselage space above and behind the pilot's seat.

The 3–D's now under construction are all being fitted with Napier-Lion engines and with the Fairey wing flap; otherwise they appear to be identical with the old 3–D.

A large single-engined seaplane has been completed and is now at Hamble in Southampton waters awaiting test. The new experimental type reconnoissance airplane mentioned above as being under construction is designed around the Curtiss D-12 engine. The fuselage is similar in design to that of the "Flycatcher" except that the "broken back" feature is omitted, as that feature is included in the

"Flycatcher" design on account of deck landing. It is to have a wing span of 33 feet 6 inches with 2½° diahedral and a decided stagger. The pilot's seat is forward and he will have two synchronized machine guns under the cowling. The observer's seat is very close to the pilot's and he is to have a twin movable gun. Fuel tank is located in the fuselage forward of the pilot. The capacity of the tank could not be ascertained. The wing struts were as follows: Diagonal struts from each side of the top of the fuselage to the upper wing; outboard struts sloping slightly outward for each wing with a diagonal strut extending from top of forward outboard strut to bottom of after one. The top wing has a slight overhang. The airplane is to be fitted with Fairey wing flaps, wing radiators, and Reid type duralumin propeller. It is expected to be ready for test early in December. It is realized that the above details are meager, but only a wind tunnel model and partly constructed fuselage were seen.

Mr. Fairey has bought the rights to manufacture the Reid type of duralumin propeller and seems extremely interested in that work. Several experimental propellers have already been manufactured. He stated that he had changed the process of manufacture from that followed by Reid in that he twisted the blade, then annealed it, and then shaped, whereas it is understood that in America the blade was first shaped, then twisted, and then annealed. Mr. Fairey also possesses the right to manufacture Curtiss D-12 engines, but it does not appear that he proposes to undertake such manufacture until after the test of the above-described experimental airplane equipped with that engine. He proposes to buy a separate manufacturing plant for the purpose of building the engines.

It was learned that the "Flycatcher" is still breaking tail skids frequently on deck landings. The tail skid is very rugged and has compression rubber shock absorbers. Mr. Fairey stated that it had been increased in ruggedness up to the point where any further increase would endanger the breaking of longerons. He attributed the tail-skid breakages to the fact that the "Flycatcher" is controllable at stalling speeds and that pilots brought it in on landing at such an angle that the tail skid frequently struck the deck before the wheels.

GREAT BRITAIN

NOTES ON FLEET AT GIBRALTAR

October, 1924

The following report has recently been received:

The British Mediterranean Fleet visited Gibraltar between September 14, 1924, and October 15, 1924. The various vessels and

units arrived individually and assembled here from various ports in the western Mediterranean (to visit which the fleet had scattered) from Malta and from Great Britain.

While at Gibraltar, the Mediterranean Fleet was augmented by the joining of the *Queen Elizabeth* class of battleships and of the second and fifth destroyer flotillas.

The flag of Vice Admiral Sir Edwyn S. Alexander-Sinclair, K. C. B., M. V. O., R. N. (recently promoted to vice admiral), was hauled down on the *Barham* (flagship of the First Battle Squadron) at sunset on October 13, 1924, and the flag of Rear Admiral W. W. Fisher, C. B., M. V. O., R. N., was hoisted on this flagship on the morning of October 14, 1924.

Vice Admiral Alexander-Sinclair, who sailed for England, was universally popular in the fleet, and the hope and expectation was expressed of his becoming commander in chief H. M. Mediterranean Fleet at a later date.

The time during which the fleet based at Gibraltar was actively employed in target practice. All units of the fleet, including the Gibraltar defense force (H. M. destroyers *Tourmaline* and *Splendid*) fired battle practice. Regulation-sized rectangular targets were used for turret guns and secondary batteries and, in addition, long-range firing by secondary batteries at the target ship *Agamemnon*, radio controlled by H. M. S. *Shikari*, was engaged in. The target ship is said to have functioned satisfactorily and the firing was successful. She suffered a number of hits below the water line, but provisions for maintaining her buoyancy have retained her seaworthiness. Spotting was done by means of planes flown from H. M. S. *Eagle* and was reported as having been quite satisfactory, as were also the maneuvers of taking off, landing, and control from the carrier itself. Eleven planes were launched and did satisfactory work for night spotting.

The fleet sailed on the afternoon of October 15, 1924, to rendezvous at sea and perform maneuvers en route to Malta.

As is usual with the British Navy, the great activity of target practice did not prevent a consideration of physical well-being and relaxation, and officers and men were landed daily whilst the ships were in harbor to permit of sports and athletics.

It was noticeable that the ships arriving from Great Britain had been recommissioned and were manned largely by recruits.

GREAT BRITAIN

TORPEDO CONTROL FOR LIGHT CRUISERS

October, 1924

The following general principles govern in regard to torpedo control for vessels of the cruiser classes:

Primary control.—To be from the fore bridge where a sight or director is fitted. Efficient communication with a secondary position and the tubes and means fitted for firing the tubes.

Secondary control.—There should be in light cruisers a secondary position well separated from the primary position and fitted in a similar manner to the primary position.

Local control.—At above-water tubes a sight should be fitted on the tube which can be set by orders from the control positions and can be used to fire the tube by, should necessity arise for going to local control.

Instruments are necessary to pass the director setting and the necessary orders to the tubes; also five gongs to give the order to fire in the event of the fore bridge firing gear failing. In all light cruisers a commissioned officer is now allocated for the control of the torpedo armament in action. He should be with the captain on the bridge or wherever the captain elects to fight the ship from, and he should have no other duties to perform in action so long as enemy ships suitable for torpedo attack remain in sight.

Range finders.—The *Raleigh* class have a 15-foot range finder for torpedo control in the combined after control position.

Tubes.—There are two submerged beam tubes forward and a pair of fixed above-water tubes on each side aft.

Circuits.—The wiring of the torpedo-control circuits is shown on the enclosed drawings (not included here) and detailed notes are not considered necessary. In addition to the circuits, the usual voice tube and telephone circuit are installed and bearing and range circuits are provided for the range finder as in heavy ships.

It should be noted that in the later "D" and "E" class cruisers there is no conning tower, but a splinter proof control platform situated abaft and above the maneuvering platform is provided instead. The torpedo control instruments and personnel occupy the foremost portion of this position on each side. This is the case in the *Raleigh* class also, except that firing keys are also provided in the conning tower.

The secondary or after torpedo-control position is combined in all light cruisers with the after gun control position on an elevated stand

abaft or between the stacks, and except in *Raleigh* class, also has searchlights mounted on it and their control positions.

A transmitting station or torpedo tracking room was originally contemplated for the *Raleigh* class, but the idea was abandoned. It has recently been again considered in connection with the new 10,000-ton *County Class* cruisers, but it is understood that the decision has been made not to provide such station.

JAPAN

AN INCIDENT AT AMOY

September, 1924

In connection with H. I. J. M. submarine *No. 69*, photographs of which appeared in last month's Bulletin, following account of certain incidents following her ramming by a Chinese merchant vessel are of interest.

The commanding officer of a British man-of-war reported that immediately after the Japanese submarine *No. 69* had been rammed by the China Merchants Co. steamer, the crew of the submarine manned their gun, but were restrained from firing by the captain of the submarine. The destroyers cleared for action, but were stopped from firing by signal. The master of the steamer immediately came over to the British vessel and requested the captain to be a member of a board to determine the responsibility and damages. The master of the steamer was a British citizen. The captain of the man-of-war explained that it might look spying, as he was an officer of another navy, but that he would go over and offer his services and see what he could do. The master of the steamer returned to his ship. A little while later the captain of the man-of-war left with pennant flying and called on the submarine. He was met at the gangway by the captain, and his coming on board prevented in every way, with much bowing and scraping, the principal excuse being that no one spoke English. It may be said here that this officer acted as interpreter when the commander of the destroyers visited the *Sacramento* in Amoy. The British captain returned to his ship. The merchant steamer moved away. Two days later the master of the steamer came on board the man-of-war and wished to thank the captain for his help. The captain said he did not see how he had helped. The master explained to him that immediately on his return to his ship an armed guard from the destroyers had come on board his ship and had locked him and his officer in

their rooms, but when the officer in charge of the armed guard had seen the launch from the war vessel with pennant flying go along the submarine that they were immediately released.

JAPAN

COMPLETE CONSTRUCTION PROGRAM

October, 1924

The following information was furnished by the Japanese Navy Department:

(A).—List of vessels under construction (i. e., keels of which were actually laid down) on February 6, 1922

Name	Type	Displacement	Date of laying down
Isuzu	Second-class cruiser	5,570	Aug. 10, 1920
Nagara	do	5,570	Sept. 9, 1920
Natori	do	5,570	Dec. 14, 1920
Kinu	do	5,570	Jan. 17, 1921
Yura	do	5,570	May 21, 1921
Abukuma	do	5,570	Dec. 5, 1921
Atake	First-class gunboat	887	Aug. 15, 1921
Nokaze	First-class destroyer	1,345	Apr. 16, 1921
Numakaze	do	1,345	Aug. 10, 1921
Namikaze	do	1,345	Nov. 7, 1921
No. 1	do	1,400	Dec. 15, 1921
Hishi	Second-class destroyer	850	Nov. 10, 1920
Sumire	do	850	Nov. 24, 1920
Tade	do	850	Dec. 20, 1920
Yomogi	do	850	Feb. 25, 1921
Hasu	do	850	Mar. 2, 1921
No. 2	do	900	Dec. 13, 1921
No. 46	Submarine	900	Nov. 20, 1920
No. 40	do	740	Jan. 20, 1921
No. 41	do	740	Do
No. 47	do	900	Feb. 15, 1921
No. 45	do	730	Mar. 10, 1921
No. 44	do	1,400	Apr. 6, 1921
No. 57	do	900	May 15, 1921
No. 68	do	665	June 2, 1921
No. 69	do	665	June 27, 1921
No. 58	do	750	July 16, 1921
No. 70	do	665	Sept. 25, 1921
No. 71	do	665	Oct. 25, 1921
No. 62	do	750	Nov. 10, 1921
No. 59	do	905	Dec. 5, 1921
Tsurumi	Oil tanker	15,400	Mar. 10, 1921
Shiriya	do	15,400	Apr. 7, 1921
Iro	do	15,400	Sept. 2, 1921
Kamoi	do	19,350	Sept. 14, 1921

(B).—List of vessels authorized but not laid down on February 6, 1922

Name	Class	Displacement	Projected date of laying down (actual)
Sendai	Second-class cruiser	5,595	Feb. 16, 1922
Yubari	do	3,100	June 5, 1922
Naka [1]	do	5,595	June 14, 1922
Jintsu	do	5,595	Aug. 4, 1922
Kako	do	5,595	Indefinite.
	8 first-class cruisers	[2] 52,000	Indefinite.

[1] Totally destroyed by the earthquake.

[2] Totals.

(B).—*List of vessels authorized but not laid down on February 6, 1922*—Contd.

Name	Class	Displacement	Projected date of laying down (actual)
Jingei	Submarine depot ship	8,500	Feb. 16, 1922
Chogei	do	8,500	Mar. 11, 1922
Hira	Second-class gunboat	338	Apr. 17, 1922
Hozu	do	338	Do.
Seta	do	338	Apr. 29, 1922
Katata	do	338	Do.
No. 3	First-class destroyer	1,400	Feb. 16, 1922
No. 5	do	1,400	May 16, 1922
No. 13	do	1,400	Nov. 11, 1922
No. 7	do	1,400	Dec. 2, 1922
No. 11	do	1,400	Mar. 16, 1923
No. 15	do	1,400	Mar. 5, 1923
No. 9	do	1,400	July 3, 1923
No. 17	do	1,400	Sept. 17, 1923
No. 27	do	1,445	Dec. 1, 1923
No. 23	do	1,445	Jan. 11, 1924
No. 25	do	1,445	Do
No. 19	do	1,445	May 21, 1924
No. 21	do	1,445	June 3, 1924
	28 first-class destroyers	[2] 29,025	Indefinite.
No. 16	Second-class destroyer	900	Feb. 16, 1922
No. 10	do	900	Mar. 14, 1922
No. 4	do	900	Mar. 15, 1922
No. 6	do	900	Apr. 5, 1922
No. 12	do	900	May 15, 1922
No. 18	do	900	May 16, 1922
No. 8	do	900	Nov. 20, 1922
	60 submarines	[2] 53,482	Indefinite.
No. 2	Mine sweeper	700	Apr. 13, 1922
No. 1	do	700	May 10, 1922
No. 3	do	700	Aug. 1, 1922
No. 4	do	700	Dec. 1, 1923
Hayatomo	Oil tanker	15,400	Mar. 14, 1922
Ondo	do	15,400	Mar. 15, 1922
Naruto	do	15,400	Apr. 11, 1922
Mamiya	Store-ship	17,500	Oct. 25, 1922

[2] Totals.

(C).—*List of vessels laid down since February 6, 1922*

Name	Class	Displacement	Date of laying down
Kako	First-class cruiser	7,100	Nov. 17, 1922
Furutaka	do	7,100	Dec. 5, 1922
Kinukasa	do	7,100	Jan. 23, 1924
Aoba	do	7,100	Feb. 4, 1924
Sendai	Second-class cruiser	5,595	Feb. 16, 1922
Yubari	do	3,100	June 5, 1922
Naka [1]	do	5,595	June 14, 1922
Jintsu	do	5,595	Aug. 4, 1922
Jingei	Submarine depot ship	8,500	Feb. 16, 1922
Chogei	do	8,500	Mar. 11, 1922
Hira	Second-class gunboat	338	Apr. 17, 1922
Hozu	do	338	Do.
Seta	do	338	Apr. 29, 1922
Katata	do	338	Do.
No. 3	First-class destroyer	1,400	Feb. 16, 1922
No. 5	do	1,400	May 16, 1922
No. 13	do	1,400	Nov. 11, 1922
No. 7	do	1,400	Dec. 2, 1922
No. 11	do	1,400	Mar. 16, 1923
No. 15	do	1,400	Mar. 5, 1923
No. 9	do	1,400	July 3, 1923
No. 17	do	1,400	Sept. 17, 1923
No. 27	do	1,445	Dec. 1, 1923
No. 23	do	1,445	Jan. 11, 1924
No. 25	do	1,445	Do.
No. 19	do	1,445	May 21, 1924
No. 21	do	1,445	June 3, 1924
No. 16	Second-class destroyer	900	Feb. 16, 1922

[1] Totally destroyed by the earthquake.

(C).—*List of vessels laid down since February 6, 1922*—Continued

Name	Class	Displacement	Date of laying down
No. 10	Second-class destryer	900	Mar. 14, 1922
No. 4	do	900	Mar. 15, 1922
No. 6	do	900	Apr. 5, 1922
No. 12	do	900	May 15, 1922
No. 18	do	900	May 16, 1922
No. 8	do	900	Nov. 20, 1922
No. 51	Submarine	1,400	Feb. 13, 1922
No. 72	do	998	June 5, 1922
No. 73	do	998	Sept. 8, 1922
No. 74	do	1,970	Mar. 12, 1923
No. 84	do	998	Apr. 2, 1923
No. 75	do	1,970	Aug. 6, 1923
No. RO–64	do	998	Oct. 15, 1923
No. 76	do	1,970	Nov. 1, 1923
No. 83	do	998	Feb. 6, 1924
No. 64	do	1,500	Apr. 1, 1924
No. 78	do	1,500	Do.
No. 2	Mine sweeper	700	Apr. 13, 1922
No. 1	do	700	May 10, 1922
No. 3	do	700	Aug. 1, 1922
No. 4	do	700	Dec. 1, 1923
Hayatomo	Oil tanker	15,400	Mar. 14, 1922
Ondo	do	15,400	Mar. 15, 1922
Narito	do	15,400	Apr. 11, 1922
Mamiya	Storeship	17,500	Oct. 25, 1922

(D).—*List of vessels canceled since February 6, 1922*

Name and class	Displacement
Cruisers:	
Kako, second class	5,595
8, first class (total displacement)	52,000
28 destroyers, first class (total displacement)	29,025
60 submarines (total displacement)	53,482

(E).—*List of vessels authorized (or substituted in lieu of those canceled) since February 6, 1922*

Name and class	Displacement	Remarks
Cruisers:		
Kako, first class	7,100	Decrease of 1 vessel.
Furutaka, first class	7,100	
Kinukasa, first class	7,100	
Aoba, first class	7,100	Increase of 10,805 tons.
Nachi, first class	10,000	
Myoko, first class	10,000	
Ashigara, first class	10,000	
Haguro, first class	10,000	
15 destroyers, first class (Nos. 28 to 42)	[1] 1,445	Decrease of 13 vessels; decrease of 7,350 tons.
29 submarines, Table (G) (H) unmentioned		Decrease of 31 vessels; decrease of 15,022 tons.

Remarks: Outside the substitution as shown above no new authorization since June 2, 1922.

[1] Each.

(F).—*List of vessels completed since February 6, 1922*

Name	Class	Displacement	Date of completion
Nagara	Second-class cruiser	5,570	Apr. 21, 1922
Natori	do	5,570	Sept. 15, 1922
Kinu	do	5,570	Nov. 10, 1922
Yura	do	5,570	Mar. 20, 1923
Yubari	do	3,100	July 31, 1923
Isuzu	do	5,570	Aug. 15, 1923
Sendai	do	5,595	Apr. 29, 1924
Jingei	Submarine depot ship	8,500	Aug. 30, 1923
Chogei	do	8,500	Aug. 2, 1924
Ataka	First-class gunboat	857	Aug. 12, 1922
Hira	Second-class gunboat	338	Aug. 24, 1923
Seta	do	338	Oct. 6, 1923
Katata	do	338	Oct. 20, 1923
Hozu	do	338	Nov. 17, 1923
Nokaze	First-class destroyer	1,345	Mar. 31, 1922
Numakaze	do	1,345	July 24, 1922
Namikaze	do	1,345	Nov. 11, 1922
No. 1	do	1,400	Dec. 28, 1922
No. 5	do	1,400	May 31, 1923
No. 3	do	1,400	June 16, 1923
No. 7	do	1,400	Apr. 5, 1924
Hishi	Second-class destroyer	850	Mar. 23, 1922
Hasu	do	850	July 31, 1922
Tade	do	850	Do.
Yomogi	do	850	Aug. 19, 1922
No. 2	do	900	Sept. 30, 1922
No. 4	do	900	Dec. 21, 1922
No. 16	do	900	Mar. 16, 1923
Sumire	do	850	Mar. 31, 1923
No. 10	do	900	May 10, 1923
No. 18	do	900	Aug. 20, 1923
No. 6	do	900	Nov. 5, 1923
No. 12	do	900	May 31, 1924
No. 8	do	900	July 24, 1924
No. 30	Submarine	900	Jan. 16, 1922
No. 38	do	740	Jan. 31, 1922
No. 39	do	740	Do.
No. 33	do	689	Mar. 9, 1922
No. 36	do	740	Mar. 15, 1922
No. 37	do	740	Apr. 29, 1922
No. 32	do	689	May 5, 1922
No. 31	do	689	July 15, 1922
No. 46	do	900	July 30, 1922
No. 40	do	740	Oct. 10, 1922
No. 47	do	900	Nov. 25, 1922
No. 45	do	750	Jan. 25, 1923
No. 57	do	900	Mar. 20, 1923
No. 41	do	740	Apr. 28, 1923
No. 68	do	665	Sept. 15, 1923
No. 59	do	998	Sept. 71, 1923
No. 62	do	750	Nov. 30. 1923
No. 72	do	998	Feb. 9, 1924
No. 69	do	665	Apr. 29, 1924
No. 71	do	665	May 31, 1924
No. 44	do	1,400	June 20, 1924
No. 73	do	998	July 24, 1924
No. 58	do	750	July 31, 1924
No. 1	Mine sweeper	700	June 30, 1923
No. 2	do	700	Do.
No. 3	do	700	Do.
Shiriya	Oiltanker	15,400	Feb. 8, 1922
Tsurumi	do	15,400	Mar. 14. 1922
Kamoi	do	19,550	Sept. 12, 1922
Iro	do	15,400	Oct. 30, 1922
Ondo	do	15,400	Mar. 12, 1923
Hayatomo	do	15,400	May 18, 1924
Mamiya	Store ship	17,500	July 15, 1924

(G).—*List of vessels now under construction (actually laid down)*

Name	Class	Displacement	Date of laying down
Kako	First-class cruiser	7,100	Nov. 17, 1922
Furutaka	do	7,100	Dec. 5, 1921
Kinukasa	do	7,100	Jan. 23, 1924
Aoba	do	7,100	Feb. 4, 1924
Abukuma	Second-class cruiser	5,570	Dec. 5, 1921
Natsu	do	3,595	Aug. 4, 1921
Naka	do	3,595	May 26, 1924
No. 13	First-class destroyer	1,400	Nov. 17, 1921
No. 15	do	1,400	Mar. 1, 1923
No. 11	do	1,400	Mar. 16, 1923
No. 9	do	1,400	July 3, 1923
No. 17	do	1,400	Sept. 17, 1923
No. 27	do	1,445	Dec. 1, 1923
No. 23	do	1,445	Jan. 11, 1924
No. 25	do	1,445	Do.
No. 19	do	1,445	May 25, 1924
No. 21	do	1,445	June 3, 1924
No. 70	Submarine	665	Sept. 25, 1921
No. 71	do	1,400	Feb. 11, 1922
No. 74	do	1,400	Mar. 11, 1922
No. 84	do	985	Apr. 2, 1921
No. 73	do	1,400	Apr. 4, 1922
No. 50–64	do	985	Oct. 15, 1923
No. 76	do	1,400	Nov. 1, 1922
No. 87	do	985	Feb. 4, 1924
No. 75	do	1,400	Apr. 1, 1924
No. 64	do	1,400	Do.
No. 4	Mine sweeper	700	Dec. 1, 1923
Notoro	Tender	10,000	Apr. 11, 1922

[1] Laying down again, owing to being totally destroyed by the earthquake. [2] Stop.

(H).—*List of vessels authorized but not yet laid down*

Name and class	Displacement	Remarks
Myoko, first-class cruiser	10,000	Ordered.
Nachi, first-class cruiser	10,000	Do.
No. 29, first-class destroyer	1,445	Do.
No. 26, first-class destroyer	1,445	Do.
No. 30, first-class destroyer	1,445	Do.
No. 31, first-class destroyer	1,445	Do.
No. 32, first-class destroyer	1,445	Do.
No. 46, submarine	1,000	Do.
No. 48, submarine	1,000	Do.
No. 50, submarine	1,000	Do.
No. I-58, submarine	1,500	Do.
No. 77, submarine	1,500	Do.
2 first-class cruisers	10,000	Not yet ordered.
20 destroyers	Indefinite	Do.
14 submarines	Indefinite	Do.
2 mine sweepers	About 700	Do.
6 net layers	Indefinite	Do.
1 mine layer	About 3,000	Do.

Vessels are expected to be completed as follows:

First-class cruisers:	
Kako	June 20, 1925
Furutaka	May 31, 1925
Kinukasa	Nov. 28, 1926
Aoba	Feb. 28, 1926
Second-class cruisers:	
Abukuma	Dec. 31, 1924
Jintsu	May 20, 1925
Naka	Dec. 31, 1925
Airplane carriers:	
Akagi	Not yet known
Kaga	Do.
Special service ship:	
Naruto	Oct. 30, 1924
Destroyers (exclusive of those to be completed after 1925):	
No. 9	Nov. 30, 1924
No. 15	Do.
Submarines:	
No. 51	Feb. 28, 1925
No. 64	Feb. 28, 1926
No. 78	May 31, 1926
No. 74	Dec. 15, 1925
No. 75	Mar. 15, 1926
No. 76	May 31, 1926
No. 84	Dec. 20, 1924
No. RO–64	Apr. 30, 1925
No. 83	May 30, 1925

JAPAN

GRAND NAVAL MANEUVERS

October, 1924

The following is an analysis of the Japanese naval maneuvers held during the period October 2 to 24, 1924, based on information from the vernacular and foreign language press:

1. Ships of the Japanese Navy were divided into two fleets, Blue, the attacking fleet, and Red, the defending fleet. The Red Fleet was composed entirely of ships in reserve and from those stationed at navy yards.

2. The maneuvers were divided into two periods. The first period from October 2 to 12, 1924, and the second period October 13 to 24, 1924.

3. The main purpose of the first period maneuvers was a test of the defense facilities against local attack by submarines, air, and gunfire of the naval stations of Sasebo, Kure, Yokosuka, and the cities of Tokyo and Osaka. Such ships as took part in the attack as well as defense of these places were drawn from the Red Fleet organization. The defending air force consisted of planes drawn from the nearest navy aviation station and were piloted by both civilian and navy pilots.

Details of the operations at the places mentioned in previous paragraphs are given below.

1. *Yokosuka and vicinity of Tokyo Bay.*—On October 2 six hydroplanes manned by civilian aviators took up air patrol. Six deck planes were sighted approaching from the direction of Cape Inubo-

saki. This information was radioed by the patrol planes to the naval air station at Yokosuka, whereupon four scout and three battle planes took the air and engaged the attacking planes. This action was completed by 11.30 a. m. On October 3 a flight of six battle and three scout planes was observed approaching Yokosuka and an air fight took place as on the previous day.

On October 4 the air patrol was continued and reinforced by the *Astra* dirigible from Kasumigaura Naval Air Station. Attack by submarines and surface ships was expected.

Temporary forts ashore were in process of construction and details of relief ambulance work, distribution of medical supplies, etc., were carried out. No further air attacks took place during the first period of the maneuvers, and preparations were continued for defense against surface and submarine attacks and against landing operations.

On October 8 the *Susaki* and *Otomari*, representing imaginary battleships, made a raid on Yokosuka. The defense was conducted by the *Chihaya*, the third, sixth, and eighth destroyer divisions, the third submarine division, planes, and the dirigible *Astra* from the Kasumigaura Naval Air Station.

Preparations were made to repel a landing force by means of emergency forts.

No further operations were reported in the vicinity and the remaining days of the first period were spent in assembling the Red Fleet forces in preparation for the second period maneuvers.

It would appear that all the above operations were a test of the defenses of the Tokyo Bay region and were conducted on the theory that an enemy would attempt landing an army near the entrance to Tokyo Bay after the local air and land defenses had been destroyed by repeated air attacks followed by gunfire from capital ships.

Sasebo.—The operations in the neighborhood of Sasebo lasted but three days. On the first and most of the second day no attack took place, and the defense operations consisted of laying a mine field to block the approach to Sasebo and establishing a submarine destroyer patrol and air patrol. During the second night the enemy air attack took place, and the enemy planes were engaged by defending planes from the Sasebo and Omura Aviation Stations and by fire from antiaircraft guns.

During the attack the lights in the city of Sasebo were extinguished.

Further air attacks were made the next morning. During this day attack a smoke screen was laid over the city of Sasebo. Men-

tion was made of participation of the army, but in what way is not known.

Kure and vicinity.—During the first two days no offensive operations in this region were reported.

Approaches were mined and an air patrol commenced.

Extra guards were stationed in navy yard, power experimental station, power plant, water reservoir, and bridges. Reconnoitering planes from Hiro Navy Yard were sent up.

The eleventh and fifteenth submarine divisions proceeded out of port and prepared to deliver an attack.

On the third day enemy planes were reported approaching from direction of Tokuyama. These planes were assumed to have bombed the reservoir and to have started fires in the navy yard.

About the same time the submarines of the eleventh and fifteenth divisions attempted to deliver an attack and were engaged by the twelfth destroyer division.

On the fourth day enemy planes attacked from two directions and were engaged by defense planes.

At the navy yard workmen were augmented to rush repair work on two destroyers and several submarines which were constructively damaged.

Osaka.—From the 8th to 11th of October attack and defensive operations were engaged in by the forces stationed at Kure. The southerly approaches to Osaka were mined, it being assumed that an enemy raid was coming via Kii Channel.

Attack was delivered by the twelfth destroyer division and the eleventh and fifteenth submarine divisions.

The *Chitose* was mentioned as partaking in the defense.

4. During the period from October 2 to 7 the Blue Fleet was apparently engaged in training operations in the Sea of Suo and by the 7th arrived at Saiki Bay; also reported as being in Shishubishi Bay. On October 12 the Blue Fleet proceeded to Omami Oshima and about the 14th proceeded to sea in a southeasterly direction.

During the first period of the maneuvers tests were made of supplying the ships of the Blue Fleet with oil and general supplies while in the open sea.

The Red Fleet gradually assembled at Tateyama and engaged in training until October 13, when it proceeded to sea to engage in maneuvers of second period.

The second period of the maneuvers commenced on October 14. On this day the Blue Fleet sailed from its base at Omami Oshima. On the day before the Red Fleet proceeded from Tateyama.

The purpose of the second-period maneuvers was apparently a test of the defense plans against an attack by an enemy fleet approaching the main island from a southerly direction.

From the position of the naval aviation stations it would appear that the Japanese estimate that an enemy fleet will most likely attack from a southerly direction.

The air defense in these maneuvers were based primarily on four points or regions:

At the Tokyo Bay region, employing the air forces of the Yokosuka and Kasumigaura Naval Stations.

The Sasebo region, employing the air forces of the Sasebo and Omura Naval Air Stations.

The Omami Oshima region, employing what was called the temporary Oshima Aviation Corps (hydroplanes *F–13*, *F–14*, *F–15*, and *F–16*).

The Bonin Island region, employing a specially organized air force, presumably of seaplanes.

In conjunction with this plan of air concentration the concentration of the Japanese Battle Fleet is at Omami Oshima.

According to newspaper reports, the first contact between Red and Blue forces occurred in the neighborhood of the Bonin Island, but somewhat to the southward on the 16th.

On this date Red submarines delivered an attack on the plane carrier *Wakamiya*.

These submarines returned without betraying presence of Red main body.

Before dark same day the Blue scout planes located the Red main body. Later Blue destroyers made contact.

At dawn on the 17th fleet action commenced and in the afternoon the maneuvers were declared over by the chief umpire, Admiral Yamashita.

NOTES.—(A) Students of the Toba Marchant Marine School were ordered on board ships of the Red Fleet during the first period of the maneuvers and practical work in the navy was given them. This was the first time students of outside schools were given an opportunity to participate in maneuvers.

(B) Dysentery broke out on the *Asama* on the 12th and she was withdrawn from the maneuvers.

(C) The *Muroto*, while towing an oil barge to the base at Omami Oshima, encountered a typhoon. Towing cable parted and the oil barge was lost. *Muroto* took shelter in Tomemi Harbor.

JAPAN

MISCELLANEOUS NAVAL NOTES

October, 1924

Seven men on board the destroyer *Tsuta* were critically burned on October 17, when an explosion occurred in the engine room during maneuvers off the coast of Tosa. At the time of the accident the *Tsuta* was steaming at full speed in pursuit of one of the enemy ships when the accident occurred. The *Tsuta* returned to Kure with the injured, arriving on the 19th.

A later report states that on investigation the cause of the bursting of the main steam line was due to a defective expansion joint and that a similar accident occurred on the cruiser *Oi* some time ago, and since then alterations to the expansion joints on many ships have been made.

Submarine *No. 58* of the fourteenth division arrived at Yu-u on October 1 in company with the other ships of the Blue Fleet to undergo certain trials. On the morning of October 1 surface speed trials of the *No. 58* were held and in the afternoon of the same day she was to undergo submerged cruise trials, but as soon as she began to submerge it was found that one of the air-supplying devices connected with the air pump was out of order and she immediately had to come to the surface. This condition was not noticed before diving.

She could not participate in the maneuvers and proceeded to Kure for repairs.

Owing to the different types of submarines in the Japanese Navy—English "L," American "S" and "AA," German "U," Italian Fiat, and Japanese Navy type—there is lack of uniformity in displacement, speed, steaming radius, and armament, and therefore much trouble is experienced in their manipulation.

To remedy this a committee was named for the purpose of devising a plan for the unification of the different types of submarines. As result, the first plan decided upon was that beginning November 1, 1924, first-class submarines will be prefixed with "I," second-class submarines with "RO" and third-class submarines with "HA."

The only first-class boats are *No. 44* and *No. 51*, now under equipment. The second-class boats are those attached to the fleet and the third-class boats will be assigned as training boats for the submarine school or to the reserve class.

As has already been reported, the Japanese submarines are to be prefixed according to displacement, and those attached to Kure have been renumbered as follows:

Old numbers	New numbers	Old numbers	New numbers
44	1-51	37	RO-16
51	I-52	22	RO-14
45	RO-26	24	RO-15
58	RO-27	27	RO-53
62	RO-28	25	RO-51
26	RO-52	34	RO-17
36	RO-19	35	RO-18

HA-3 to HA-8, inclusive, will retain their same numbers.

NOTE.—The JapaneseNavy Department was asked to confirm the above and for a list of renumbered submarines, but no reply has so far been received.

Due to the strong opposition of the navy, the postponement of the building program was abandoned by the Cabinet and the appropriation for this item, ¥88,000,000, was passed by the Cabinet Council as it stood. However, some changes were made in the remainder of the yearly apportionments, which is as follows:

1925-26	¥88,000,000
1926-27	80,000,000
1927-28	49,000,000
1928-29	96,000,000

The above apportionment of funds was made during the Yamamoto Cabinet and was of a temporary nature, and on account of the earthquake calamity made it necessary to delay the completion of the building program by one year. However, from the standpoint of construction, it was long ago considered that the above apportionment was wrong, and it has now been decided to remedy this and apportion the balance ¥313,000,000 as follows, this to be presented to the next Diet for approval:

1925-26	¥88,000,000
1926-27	80,000,000
1927-28	75,000,000
1928-29	70,000,000

In regard to the alteration expenditure, approximately ¥50,000,000, which is to be completed by 1936-37, the Finance Department requested a reduction of 50 per cent down to 1931-32 and to stop work entirely after that date. The navy strongly opposed this, and it was finally agreed that the giving up of "Continuing expendi-

tures" will be deferred for the time being and that only the question of the apportionment for 1925–26 will be considered. Further, the navy agreed to reduce the 1925–26 apportionment ¥2,290,000 (approximately) by 50 per cent. The apportionment after 1925–26 was left unsettled, to be settled between the two departments before the opening of the next Diet.

Due to there being no restriction of limitation as regards destroyers, the powers are increasing their tonnage and speed. In Japan, are building first-class destroyers with a tonnage of 1,400 and speed of 34 knots, and second-class destroyers with a tonnage of 900 tons and a speed of 32 knots. The third-class destroyers now in the service are no longer of any use in this branch of the service, and, even in the present maneuvers, they only participated in the first stage near shore.

It has been learned that the Navy Department is going to take all of the third-class destroyers out of the destroyers list and convert them into mine-sweepers, attaching part of them to the mine-sweeping division now under the flagship *Tokiwa*. The boats to be dropped are as follows:

Attached to Yokosuka:

Eighth division: *Ariake*, *Fubuki*, *Kamikaze*, *Hatsushimo*, *Kisaragi*, *Hibiki*.

Sixth division: *Shiratsuyu*, *Mikazuki*, *Yudachi*, *Yugure*.

Attached to Kure:

Eleventh division: *Oite*, *Hayate*, *Yayoi*, *Uzuki*, *Hatsuharu*.

Twelfth division: *Kikuzuki*, *Minazuki*, *Ayanami*, *Isonami*, *Urnami*, *Nagatsuki*.

Attached to Sasebo:

Twenty-ninth division: *Ushio*, *Nenohi*, *Asakaze*, *Wakaba*, *Harukaze*, *Hatsuyuki*.

NOTE.—The Navy Department shows 33 third-class destroyers, whereas only 27 are shown in the above list. It is not known what disposition will be made of the 6 remaining third-class destroyers.

The cabinet has approved the plan to pay special allowances to the personnel of the navy who will be retired on account of the financial retrenchment. This will be divided into classes as follows:

(A) Longevity pay, an amount equal to that obtained by multiplying the number of full years served by five-tenths of their monthly pay at date of retirement.

(B) Retirement allowance computed as follows:

Admiral and vice admirals	8 months pay.
Rear admirals	9 months pay.
Captains	13 months pay.
Commanders	16 months pay.
Lieutenant commanders	19 months pay.
Lieutenants	21 months pay.
Sublieutenants, first and second grade	24 months pay.
Special and warrant officers	12 months pay.

For petty officers and men.—(A) Same rate as for officers.

(B) Minimum 6 months, maximum 12 months.

The above allowances are special allowances and are in addition to regular retired pay.

A Dornier bombing monoplane arrived in Japan from Italy about one month ago and is now at Kawasaki Works at Kobe. Believed to be Amphibian, but not certain. This machine is a seaplane of Wal type, all metal, and is engined with two Rolls-Royce 360 h. p. motors. Informant said that in his opinion this type machine will be used by the Japanese Navy in place of the Mitsubishi triplane, which has been unsuccessful and production stopped.

Mitsubishi No. 1, which is the single-seater fighting machine, and Parenll Panther are the type planes used on the *Hosho*.

The navy has the following number of planes of various types, including training planes:

(1) At Kasumigaura	150
(2) At Yokosuka	100
(3) At Sasebo	28
(4) At Omura	10
Total	288

The following shows the organization which will be in effect on November 1, 1924:

Yokosuka:	
Scout seaplanes	1 company.
Scout airplanes	½ company.
Deck planes	1 company.
Balloons	Do.
Kasumigaura:	
Scout seaplanes	1 company.
Training seaplanes	½ company.
Deck scout planes	1½ companies.
Deck training planes	2 companies.
Dirigible	1 company.
Experimenting planes	Do.

Sasebo:
Scout seaplanes ..... 1 company.
Scout airplanes ..... Do.
Omura:
Deck battle planes ..... Do.

Doctor Rohrbach, of the Rohrbach Metal Airplane Co., states that the Japanese are greatly interested in metal airplane construction and intend to develop duralumin production in Japan, making use of aluminum ores found in the northern part of the islands. This development has been underway for about one year and is under the control of a subsidiary of the Mitsubishi Co. (Mitsubishi is Rohrbach's Japanese licensee). License for duralumin manufacture is purchased from the Durener Metalwerke, Duren. Japanese personnel was sent to Duren to learn methods and Duren Metalwerke is now in Japan assisting in establishing the process. Within a year duralumin of Japanese manufacture should be available. Meanwhile considerable quantities of German and British made duralumin have been purchased and shipped to Japan.

On November 8, 1924, Kasumigaura Naval Aviation Corps will hold memorial services for those aviators who died in the performance of their duties. In addition to the ceremony, aviation maneuvers on a large scale are to be held. Bombing of an imitation city and torpedoing of imitation war vessels, experiments with bombs, fish torpedoes, smoke screen, illuminating bombs, and machine guns will be held.

The Minister of Marine and other high naval officials will attend. High army officials have also been invited to attend.

NOTE.—Inquiry was made at the Japanese Navy Department as to whether or not naval attachés would be invited to witness the above and the reply was that due to the above being in the nature of a memorial service naval attachés would not be invited.

The destroyer *No. 11*, under construction at the Uraga Dockyard, will be launched November 27, 1924.

The keel of the first class cruiser *Myoko* was laid down at the Yokosuka Naval Station on October 25, 1924. She will have a displacement of 10,000 tons and is expected to be completed in 1927.

Port Arthur Defense Corps, which was formerly a secondary naval station and reduced on account of the naval limitation leaving there only a defense corps, is again to be reduced on account of the financial retrenchment, and the defense corps now stationed there is to be withdrawn from March, 1925.

It has previously been stated that the Airship Guarantee Co. (Burney) had made a proposition to the Japanese Navy Department substantially to this effect: That the Japanese Navy would order an airship to be constructed simultaneously with the airship ordered by the British Air Ministry from the Airship Guarantee Co., to be built under identical contract conditions and price, delivery to be made by the contractors to Japan via the Egypt-India air bases to be established. This proposition was favorably considered by the Japanese and considerable correspondence appears to have been exchanged, but it is now definitely stated by a responsible representative of the contractors that although the Japanese Navy approved the scheme they could not secure approval by the Prime Minister of the expenditure at this time "due to the economic situation of Japan."

It appears that there are strong hopes of a successful culmination of the negotiations with a change of Government in Japan, such a change being likely to take place in the near future.

JAPAN

STRENGTH OF NAVAL PERSONNEL

1924

Number of officers, commissioned, special service, and warrant officers in the Japanese Navy on September 1, 1924:

Total executive and engineer	3,364
Total staff	1,023
Total special officers	879
Total warrant officers	1,561
Total number	6,827

Number in each grade and corps

Corps	Admiral	Vice admiral	Rear admiral	Captain	Commander	Lieutenant commander	Lieutenant	Sublieutenant, first class	Sublieutenant, second class	Total
Executive	11	11	37	125	284	505	678	380	432	2,463
Engineer		2	9	36	97	186	241	154	176	901
Medical		1	5	18	48	70	128	90	60	420
Apothecary				1	2	2	8	4	4	21
Paymaster		1	5	18	35	67	120	60	51	357
Construction			3	12	11	5	15	15		61
Construction engineer			2	3	4	2	10	10		31
Ordnance			4	2	12	12	62	34	2	128
Hydrographic				1	4					5
Total	11	15	65	216	497	849	1,262	747	725	4,387

Special service and warrant officers

Corps	Special service	Warrant officers	Total
Executive	423	719	1,142
Engineer	347	621	968
Bandmaster	7	11	18
Carpenter	31	51	82
Wardmaster	13	39	52
Paymaster	58	120	178
Total	879	1,561	2,440

Midshipmen, etc. (July 1, 1924)

Midshipmen:	
Executive	254
Engineer	101
Paymaster	36
Total	391
Cadets:	
Executive	510
Engineer	193
Paymaster	71
Total	774
Students in outside schools:	
Medical	66
Construction engineer, ordnance, construction	37
Total	103

Personnel attached to aviation

Officers			Special service and warrant officers			Petty officers and men		
Naval aviators	Mechanicians	Ground	Naval aviators	Mechanicians	Ground	Naval aviators	Mechanicians	Ground
100	38	50	1	0	0	57	47	400

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Personnel attached to aviation under instruction

Officers			Petty officers and men		
Naval aviators	Mechanicians	Ground	Naval aviators	Mechanicians	Ground
25	6	8	38	44	100

Civilians performing duty for the Navy

Higher civil officials			Hannin rank			
Instructors	Experts	Others	Employees	Clerks	Assistant experts	Others
41	188	31	77	303	708	104

NOTE.—Higher civil officials rank from captain down to sublieutenant, second-class. Hannin Rank, rank from warrant officer down to petty officer, third-class.

List showing average number of officers and men on board each class of ship

Number of ships from which average is taken	Class of ship	Average number of personnel on each ship	
		Officers	Men
10	Battleships and cruisers	73	1,244
18	Light cruisers	36	405
2	Airplane ships	40	350
4	Submarine tenders	24	252
3	Mine layers	30	436
11	Coast defense ships	34	467
13	Gunboats	10	86
80	Destroyers	10	114
35	Submarines	7	35
29	Special service ships	15	150
3	Mine sweepers	7	84

Distribution of personnel afloat (Aug. 1, 1924)

Number of ships	Class of Ship	Complement	On board
[1] 10	Battleships and battle cruisers	12,442	11,562
[2] 18	Light cruisers	7,314	6,859
2	Aeroplane ships	701	701
4	Submarine tenders	1,009	1,009
3	Mine layers	1,309	1,309
[3] 11	Coast defense ships	5,146	4,317
[4] 13	Gunboats	1,121	983
[5] 80	Destroyers	9,124	8,675
35	Submarines	1,250	1,250
[6] 29	Special service ships	4,352	3,874
3	Mine Sweepers	252	252
	Total	44,020	40,791

[1] Includes 1 second reserve and 1 third reserve ship.
[2] Includes 3 second reserve and 1 third reserve ship.
[3] Includes 4 second reserve and 2 third reserve ships.
[4] Includes 1 second reserve and 1 third reserve ship.
[5] Includes 12 second-class destroyers in second reserve and 8 second-class destroyers in third reserve.
[6] Includes 2 in second reserve and 4 in fourth reserve.

Distribution of enlisted personnel ashore (September 1, 1924)

Naval stations and offices	443
Hospitals (operating force)	457
Naval barracks	2,217
Secondary naval stations	397
Aviation stations	2,342
Defense corps	2,737
Communications (operating force)	221
Trade schools	1,374
Total	10,188
In addition to those shown above there are:	
Substitute men at naval barracks	790
New recruits	5,000
Under special training	7,000
In hospitals (patients)	1,332
In prisons or deserters	303
Total	14,425

Number of men and class of service (September 1, 1924)

	Number	Term of enlistment (years)
Conscripts	16,824	4
Volunteers	33,328	6
Total	50,152	

First and second reserve

	First reserve	Second reserve	Total
Officers, including warrant officers	1,664	509	2,173
Petty officers and men	21,048	9,837	30,885
Total	22,712	10,346	33,058

No reserve officers or men in the Japanese Navy on active duty.

NOTE.—The total number of petty officers and men in the Japanese Navy is shown below:

Petty officers	15,252
Men	50,152
Total	65,404

FRANCE

ESTIMATE OF THE STRATEGIC SITUATION

September, 1924

(Prepared by a committee at the Army War College)

(I) Geographic Situation

France is situated in the western part of Europe and contains 212,700 square miles of territory.

Because of location and considering the economic and political questions which may be involved, England, Germany, Italy, and Russia may be considered as probable enemies. Her other neighbors are not considered because of size, location, or lack of military strength, and resources.

France has treaties of alliance with Belgium, Poland, and the Little Entente. England, Italy, and even Germany may be allies, depending upon their interests from time to time.

French dependencies are in every part of the world, the largest and most important colonial possessions being in North and West Africa.

LOCATION OF VITAL AREAS

(*a*) *Agricultural.*—France is an agricultural country, less than one-tenth of the land being nonproductive. The most fertile areas are in the north, northeast, and along the valleys of the Gironde and Rhone Rivers. The least productive sections are in the mountain regions of the Alps and Pyrenees and along the marshy lands of the west.

(*b*) *Industrial.*—The industrial areas are, in general, in the northeast and around Paris, although a redistribution is being made at the present time, with a view of removing them from the borders and at the same time taking full advantage of all water power available.

(*c*) *Mining.*—While coal is found in small quantities in all parts of France, the principal areas are in the northeast. Iron is found in the central part, the greatest production being in the vicinity of Rhone and in the Pyrenees. These vital areas are protected by mountain ranges and seacoasts, with the exception of those located along the northern border.

Nature of coast lines.—The coast line is largely low lying and unbroken along the southern part of the Atlantic coast as far as the Gironde, but from here to the north the coast is cut by numerous bays and capes. While it is in general low lying along the English Channel, there are cliffs between the Seine and the Somme and about

Boulogne. From the Spanish border to the Rhone the Mediterranean coast is also low lying and unbroken, but to the east it has numerous small bays and several harbors. The principal ports are Havre, Cherbourg, Brest, Bordeaux, Marseille, and Toulon.

The coast between the Gironde and the Loire Rivers offers the best opportunity and most favorable points for landing an oversea expedition against France, because it is low lying and has several good ports and good communications with the rest of France.

MILITARY ASPECTS OF THE PHYSICAL GEOGRAPHY

1. *Topography.*—A line drawn from Bayonne to the northeast to Troyes and then north through Rheims to the border separates the highland plateaus and mountain regions of the east and south from the lowlands and valleys of the north and west. The principal rivers lie in the north and west and flow into the Atlantic and the English Channel. They are navigable for first-class ships for an average of 30 miles and for small boats for 300 miles or more. The Seine drains into the English Channel, the Loire and Gironde into the Atlantic, and the Rhone into the Mediterranean.

The Pyrenees Mountains between France and Spain afford few passes, the only one suitable for railroads being around the ends.

The Alps between France and Italy are the highest in Europe, and as the slopes are steep on the east and more gentle on the west, they afford a more natural defense for France than a point of invasion for Italy.

North of the Alps, the Jura Mountains separate France from Switzerland.

On the east the Rhine River separates France and Germany, with the Vosges Mountains lying just to the west of the river. The Rhine Valley is connected with that of the Rhone by the Doubs River Valley, thus forming a natural gateway from north to south.

The boundary from the Vosges to the Ardennes Mountain is a series of plateaus. To the west of the Ardennes the land is level.

(*b*) *Climate.*—The climate of France is temperate, but the range between summer and winter is much greater in the mountain regions than it is along the coast. The greatest contrast is between the bleak climate of the Alps and the almost subtropical climate along the Mediterranean.

(*c*) *Natural routes of invasion by neighboring states.*—1. The Sombre-Oise Valley and to the north and west affords a broad and level route offering no topographical obstacles other than the possible flooding of Flanders, and this route at the same time enables the invader to take the plateau region to the east, in flank.

2. The broad front between the Ardennes and Vosges Mountains is the natural route between France and Germany. It consists of a series of plateaus which slope gently to the west, but have steep eastern faces. For this reason they offer good defensive positions for France, as each western plateau affords a good view of the slope to the east.

3. The Alps afford three routes—through the valleys of the Var, the Durance, and the Isere Rivers. These are divergent from Italy, have few good roads, and will not permit the movement of large bodies of troops: these facts, connected with the nature of the slopes, make these routes easy of defense from the French side.

(*d*) The only probable route of invasion of Germany by France lies between the Vosges and Ardennes Mountains. The most difficult obstacle, when not under the control of the French, is the Rhine River.

Because of her extended frontiers and foreign possessions, France has adopted the military policy of maintaining a large standing army, fully officered, well trained and capable of rapid expansion, and ready to assume the offensive on continental Europe.

(II) Political Situation

A. INTERNAL CONDITIONS

1. *The people.*—The blending of a conglomerate mixture of races has developed in France to-day, a strong, patriotic, and homogeneous nation, which is bound together by a strong sense of nationality. Since external and internal turmoil has been the history of France, this has caused the people to draw to themselves, to obliterate race prejudice, to rise up in mass against foreign aggression, and to become imbued with a patriotic and sympathetic feeling toward their country, all of which constitute a military asset to the nation.

When national security is endangered, public passion will at times assert itself against the policy of the Government and demand a change in policy, which constitutes an element of military weakness.

The population has remained stationary for the past 40 years, this being attributed to low birth rate and excessive deaths. Deaths are attributed to defective hygenic conditions among the agricultural classes and influenza epidemics.

The people are devoutly religious, with the Roman Catholic faith predominating. No religion is now recognized by the State.

The recuperative power and resourcefulness of the people, even when confronted with the most adverse circumstances, have marked the history of the French race.

Illiteracy is practically negligible, as excellent educational facilities are provided in both private and public schools. Military education is provided for in the public schools as well as special military service schools.

Although class distinction is very pronounced, solidarity and military effectiveness have been exemplified by the people in all their foreign wars. Preservation of their country is placed above individual or class interest. Constant fear of German aggression has made France an essentially military race.

2. *The State and Government.*—(*a*) *Form and administration.*—France is a democracy with a republican form of government.

The administration of the Government is centralized, composed of an executive and a legislative branch.

The executive authority is vested in a President, elected for seven years by the two chambers sitting as a National Assembly, and a Ministry chosen by the President.

The President's authority consists mainly in the enforcement of the laws passed by the two chambers. He can declare war only with the consent of the Legislature.

The Ministers virtually exercise all executive authority, which gives France a parliamentary or cabinet government, which does not insure stability nor effectiveness in war, as it is unwieldy and subject to sudden change.

The legislative powers are vested in a Chamber of Deputies, elected for four years by direct vote of manhood suffrage, and a Senate elected by an electoral college for nine years, one-third every three years.

The Chamber of Deputies more directly represents the people, and has greatly overbalanced the Senate. All financial bills must be presented in this chamber.

The Senate, in addition to its legislative acts, constitutes a high court of justice in cases involving the safety of the State.

The Department and the commune are the two main subdivisions for local government.

(*b*) *Political parties.*—The political parties, of which there are seven in number, exert a great influence upon the administration of the Government, as the minor groups swing first with one party and then with another, in accordance with public sentiment, and, besides, no single party has a majority in either House.

The two main parties are the National Bloc and the Radical-Socialist Bloc.

This political situation constitutes an element of internal weakness not only for the effective administration of the Government

but for the purpose of making war, as well as insuring governmental stability and effectiveness in the prosecution of a war.

In event, however, of a foreign threat in which the security of the nation is involved, public sentiment would result in a concerted and loyal action on the part of all parties in the effective prosecution of a war, with the probable exception of the communistic group.

The extreme socialistic and the communistic elements constitute the greatest source of internal weakness to the Government, but their influence is held under restraint, as they are opposed by all the other groups. A war of aggression would be bitterly opposed by these elements.

The press, which represents all political factions, exerts a great deal of influence upon the people politically.

(*c*) *Present political leadership.*—The Radical Left Bloc, which now controls governmental affairs, advocates an extremely liberal policy, both internally and externally.

The present liberal Cabinet represents more nearly the attitude and feelings of the people, who are demanding peace as well as assurance of national security.

In internal affairs the party advocates an adjustment of labor difference, an income tax, promotion of economic differences, maintenance of state monopolies, equality of education, reduction of the military force, separation of the church and state, maintenance of the democratic tradition of France, social peace with amnesty of political offenders, and reduction of taxes.

Externally the party advocates evacuation of the Ruhr upon acceptance and abidance with the Dawes plan as agreed upon at the London conference, a Franco-German trade agreement, a settlement of their inter-allied debt, an adjustment of all international differences of France with other nations of Europe, recognition of Russia, with precaution that communistic doctrine will not be advocated in France.

National security is demanded against future German aggression and no disarmament will be agreed upon until this assurance is made.

Although the present administration has been in governmental control but a few months, all acts to date have been supported. Indications are that if the policies advocated are successfully carried out, the administration will receive the unanimous support of the people.

(*d*) *Present internal conditions concerning the State.*—Although discontent is shown in some sections amongst the working classes on account of the large number of foreigners now in France, excessive taxes, and high cost of living, the labor situation as a whole is very satisfactory.

The failure to increase the birth rate, the migration of rurals to the cities, and the inflation of all wages are the main concerns of the farmers and employers.

(*e*) *Present external conditions concerning the State.*—The Government of France is at present mainly concerned with the readjustment of international differences between her allies and Germany.

The conditions in Syria and Morocco, which have recently been causing considerable concern, are being satisfactorily adjusted.

Cordial international relations with her allies and with Germany are eagerly sought by France.

CONCLUSIONS

The French people are homogeneous, patriotic, and loyal to their country. They are imbued with a strong sense of nationalism and will rise up in mass in defense of their country against a foreign aggressor.

Although fear of German aggression has developed a strong military nation, the spirit of the people to-day is for peace and reconciliation. This has caused the Government to institute a liberal policy with respect to internal and external conditions affecting the country.

If these moderate methods prove unsuccessful, France will return to the conservative policy which she has adhered to since the World War.

France to-day is the most progressive and prosperous country in Europe.

Her relations with the United States remain friendly. Although there exists apparent evidence of weakness in their system of government with respect to war-making purposes and the prosecution of a war, class and political differences will give way to unity of effort if the question of national security is at stake.

B. FOREIGN RELATIONS

During the life of the Third Republic, 1871–1924, French foreign relations have been directed under an imperialistic national policy based upon the fundamental principle of security and prosperity and supported by a highly developed sense of nationalism in the French people.

The conduct of French foreign relations during this period has been characterized by consistency of purpose and a clear conception of the national aims and ambitions regardless of the political set-up of the Government.

Under the peace settlements embodied in the treaties of Versailles, St. Germain, Trianon, Sevres, and other agreements, new states have been created, the boundaries of old states have been changed,

old states have been eliminated, and new agencies have been set up to supervise the execution of the treaties. Thus, the map of Europe and the political situation have been changed. The old balances have been destroyed and new alignments are in order. In this situation France is the dominant power in Europe. On the other hand, Germany is impotent from the military viewpoint and, while a united state, is but a passive element in the political situation.

At the present time French foreign policy is directed toward the hegemony of France in Europe. France is prepared to attain this position not only by her own military strength but by that of her allies.

French foreign policy is primarily concerned with the execution of the treaties above mentioned, and in particular the treaty of Versailles. There are two outstanding major questions involving conflicting interests. These are reparations and boundaries.

Reparations is purely an economic problem, although other aims are involved. Great Britain has great unemployment due to the dislocation of world trade. She desires to hasten the economic recovery of Germany and the restoration of world trade. Hence, she does not desire reparations in kind.

France has no unemployment and her economic situation is such that reparations are vital. The receipt of reparations in kind will not disturb her economic system. France desires the economic recovery of Germany in order to insure payment of reparations, but does not desire Germany to menace the security of France. Germany desires to recover and to evade the economic clauses of the treaty of Versailles.

The tense situation which has existed since the occupation of the Ruhr by France and Belgium in January, 1923, has been relieved by the recent London conference and the adoption of the Dawes plan.

The Dawes plan calls for heavy payments for an indefinite period. It remains to be seen whether Germany will comply. The Dawes report showed that Germany could pay: France is prepared to force her to pay and reserves liberty of action.

The boundaries question is of great importance to France, Belgium, and the new States created under the peace settlements mentioned above. To the new States the treaties are the charters for their existence and they view with concern the efforts of any State to evade the peace settlements or to seek revision of the treaties. Hence, in their common interests and in the maintenance of the status quo, Belgium, Czechoslovakia, Yugoslavia, Rumania and

Poland have concluded defensive alliance with France. The active military strength of this combination is more than 2,000,000 men.

The relations of France with Italy and Spain are satisfactory except with reference to the control of the Mediterranean and Adriatic. It has been announced that relations with Russia will be resumed when the question of pre-war debt to France is adjusted.

The relations of France with the United States have been friendly for many years and have been marked with sympathy and understanding. The only point of conflict now existing is the war debt owed by France to the United States. Public opinion in the United States demands the funding of this debt. Unless this is done within a reasonable time the relations of these two States will be adversely affected.

The further default by Germany, the adoption of extreme measures by France, or an indication that France intends to continue the occupation of the Saar Valley and the neutral zone in Germany will bring on a crisis. The guaranty clauses of the treaty of Versailles expire in 1930–1935. The League of Nations as at present constituted is impotent to intervene. If such a crisis should arise, France, Belgium, and the Little Entente will stand together.

The present policy of the United States with respect to Europe is one of detachment and cooperation. Decision as to the time, place, and method of cooperation is reserved by the United States. In a European crisis such as is indicated in the preceding paragraph the United States will not participate.

In the event of a Blue-Red, Orange-Green war, separately or collectively, France will remain neutral.

(III) Economic Situation

A. FOOD

The agricultural rehabilitation of France has progressed very rapidly since the war and the areas cultivated in principal crops will soon equal the pre-war acreage, while the quantity of food supplies produced will very shortly exceed the pre-war totals because of additional areas being brought under cultivation, together with the employment of better methods of farming and the increased use of modern farming machinery and implements. These factors give certain promise that in a relatively short period the nation will become entirely self-sustaining.

The invasion and devastation of large arable areas and their disuse during the war, together with losses by capture and unusual slaughter of cattle and shortage of labor, have reduced production, whereby heavy imports have been a necessity.

The rehabilitation of fields and the reconstitution of herbs have not as yet progressed to an extent of making production entirely sufficient for actual requirements of the population.

It is estimated that the necessary food imports at present are only about 10 per cent. This dependence upon imports is steadily decreasing.

The herds are being increased and improved by the encouragement given by the Government to the importation of frozen beef, the restriction of exports of cattle, hogs, sheep, and meat, and the development of the fishing industries. This policy will result shortly in increasing the number and slaughtering value of cattle and in material gains in dairy products.

A substantial increase in the production of corn has resulted from the war experience of France.

Beet-sugar production is being increased as the devastated sugar fields are being restored to cultivation. The sugar production for 1922 and 1923 is given at 550,000 tons, which is about 65 per cent of the normal pre-war production and in excess of the physiologic needs of the country.

The effect of improved methods of cultivation is shown in the wheat crop of 1921, which exceeded that of 1913 by approximately 450,000 quintals, when there were nearly a million less hectares under cultivation than in 1913. While favorable climatic conditions no doubt had much to do with this, yet it is evidently true that improved methods of farming were greatly responsible for the large increase in the average yield per acre. In 1923 there were 13,656,000 acres of wheat sown, which produced 290,456,000 bushels. This was 18,914,000 bushels less than in 1913. The yield, however, was obtained on 2,510,000 fewer acres, which also shows a large increase per acre over 1913.

In 1921 the population of France, including the reconquered territory of Alsace and Lorraine, was less by nearly 400,000 than in 1911. The population is now practically static and is less than the pre-war year of 1913, when ample food was produced in pre-war France to sustain her people. The total food production is now practically equal to that of 1913. Alsace has added materially to France's food-producing capacity.

In another war France would have not only the regained territory which was taken and held by the enemy during the World War, and which contained nearly one-tenth of its arable area, but it would have, in addition, the arable land contained in Alsace-Lorraine (Alsace being especially fertile) upon which to depend for her food supply.

B. INDUSTRIES AND MUNITIONING CAPACITY

The industrial population of France is fully employed and her output in most of her fields of production is limited only by lack of coal and the dearth of man power.

Since the war France, through the acquisition of Alsace-Lorraine, has acquired additional material resources and through modernized industrial equipment, intelligent organization, better distribution, more skilled direction of her forces, and by the more general adoption of labor-saving devices and of what is known as series production or standardization of product, she has acquired a largely increased potential industrial power over the pre-war period. By relocating many of her newly constructed industrial plants away from her frontier they are rendered less liable to interruption from invasion.

She has brought within her area large new resources in ores, coal, potash, and some oil, as well as great and highly developed metallurgical, engineering, and textile industries.

In the great basic industries of the country there has been a movement toward groupement or consolidation both on regional and natural lines. This movement looking toward economy in production has also been observed throughout all the other branches of French industry.

The war disastrously affected the industrial capacity of France, not only on account of the invasion and devastation of the northern provinces in which industrial plants were most numerous and important mines and intensely cultivated fields were located, but also by reason of the great loss of life. The increased, improved, and modernized industrial plants which have taken the place of those destroyed will, however, make for manufacture and production in greater volume and efficiency than before and in large measure have already taken care of the loss occasioned by the war.

The labor shortage is being supplied in part by employment of foreigners. Women and even children are also being used to take the place of the lost man power.

Iron, steel, bauxite, and potash are produced in quantities far beyond any possible peace or war needs and are important commodities of export.

The lack of coal, especially of a variety producing coke, is a source of anxiety to France and tends to restrict the fullest development of the newly acquired metallurgical industry and iron ore mines of Lorraine.

In a large measure the relatively scant production of coal is the urge in the general water-power development now being undertaken. Water power has increased from 750,000 horsepower in 1914 to

2,200,000 horsepower in 1923. This will be increased to 2,500,000 horsepower during 1924. It is estimated that the full water-power development will release 78,000,000 tons of coal for other uses. This development is and will be the prime factor in relieving if not in solving the coal problem.

Cotton must be imported, but efforts are being made to develop cotton growing in France's African colonies.

France is dependent either in whole or in part upon imports for the following minerals: Chemicals, raw material, and other products necessary in her peace and war time industries; nitrates, bromine, manganese, chromium, tungsten, mercury, tin, antimony, lead, copper, nickel, platinum, hides, zinc, petroleum, rubber, timber, wool, and silk.

Ample salt is found in France.

France to-day has one of the largest potential munitioning capacities in the world. At present she could produce munitions more rapidly and in greater numbers that any other country. France is maintaining reserves of munitions for an army of 3,000,000 men.

To avoid the danger of being found without a supply of petroleum, France is constructing reservoirs with a capacity of nearly 700,000 cubic meters.

France is able in an industrial capacity and in a munitioning capacity to meet the demands of a major nation in war and is sufficiently powerful to take the initiative in war in order to gain the earlier advantage.

Her capacity to manufacture material is adequate for her own requirements and in a measure for her allies.

She has many of the needed raw materials, but must be assured of open sea routes for importation of cotton, fuel, oil, and other necessities to engage in a war of long duration.

C. FOREIGN COMMERCE

France is prosperous commercially and industrially and unemployment does not exist. French foreign trade in 1923 increased both in volume and value over 1922 and the adverse trade balance was much reduced. For the first half of 1924 there was a decided improvement over the same period of 1923, and the trade balance was in her favor, amounting to over 1,000,000,000 francs.

Measured in tonnage, French foreign trade already has surpassed its pre-war figures. Trade with her own possessions is gaining in importance.

The increase during 1923 and the first half of 1924, in exports, were fairly evenly distributed over all classes of commodities, while the increase in imports were mainly concentrated on raw materials.

The per cent of imports covered by exports were as follows: 1913, 82 per cent; 1922, 86 per cent; 1923, 93 per cent.

Coal, coke, oil, copper, cotton, nitrates, rubber, and sulphur are the principal articles that will have to to be imported.

Coal and coke, from Germany, Belgium, Great Britain, or the United States; oils from the United States, Rumania, or Mexico; copper from Spain, Mexico, or the United States; cotton from India, Egypt, or the United States: nitrates from Chile, or else nitrogen obtained from the air; rubber from Africa, South America, or Mexico; sulphur from Spain.

France produces iron, steel, and potash beyond her needs and is practically self-supporting as to food.

The four principal customers of France are Great Britain, Belgium, United States, and Germany.

CONCLUSIONS

France, engaged in war with an enemy that had control of the sea, would be seriously interfered with in obtaining raw materials.

She is practically self-contained as to food, and with her colonies and regions under French control as sources of supply she has practically everything needed except oil for a war of short duration. To engage in hostilities of long duration she must have raw materials and be assured of open sea routes for importation of cotton and fuel oil, and must preserve her communications in North Africa to supplement her supplies.

D. FINANCE

The condition of French finances at the present time is very serious—this unsatisfactory condition caused by heavy war expenditures, necessary payments for war damages and payment for reconstruction, and the failure to obtain reparations from Germany on any substantial scale. The three principal financial problems which France faces to-day are her huge national debt, her currency depreciation, and her unbalanced budget.

The total French public debt on July 31, 1914, was about 34 billion francs. The total at the present time is about 430 billion francs. For the past few years it has been increasing by 25 to 30 billion francs a year, which has been met by borrowing. Of this large national debt about 306 billion francs is internal and about 124 billion francs foreign debt.

This represents at least a fifth and perhaps as much as a third of the total wealth of the nation, obviously a grave burden. On the internal debt, the interest charges are over one-half of the Government revenues.

France has paid little attention to her foreign debt. She makes a distinction between the "political" debt and the "commercial" debt. The advances made by the United States and Great Britain during the war are classified as "political" debt, while the amounts due these two Governments for supplies purchased from them after the armistice and the private loans to France from American and British investors are listed as "commercial" debt, which France regards as an obligation ranking ahead of its "political" debt.

France has a considerable amount owed her by other countries—Russia, Belgium, Yugoslavia, Rumania, Poland, Greece, Czechoslovakia, Italy, Latvia, Esthonia, Lithuania, Hungary, and Austria—the total amount being about 53 billion francs. France's share of the present reparation bonds amounts to 104 billion francs. This gives France a total credit against foreign governments of 157 billion francs. The value of this claim depends, of course, upon the outcome of the entire European situation.

The Bank of France is the only note-issuing bank in France: it is a central bank to which other banks of France may and do turn for aid when needed; it is the fiscal agent of the French Government and it is the custodian of the gold reserves of the country. Its capital is fixed at 182,500,000 francs. The gold reserve is 5½ billion francs. The bank advances to the State are now about 23 billion francs and notes in circulation are about 37 billion francs.

The value of the franc at the present time is about 5 cents or a fraction over.

Taxes were increased by 20 per cent this year and the yield for the first half of 1924 is considerably over the budget estimates and receipts for the corresponding period of 1923. It is expected to add about 6 billion francs of new revenue to the general budget this year. The total yield from all sources in July was 2½ billion francs, the highest sum ever reached.

The Government plans to finish reconstruction in two years more, spending 24 billion francs in the work. This puts the total for reconstruction at about 80 billion francs. It is now to be carried on by the proceeds of taxation.

In France great dependence has been placed in the payment of reparations by Germany for the reconstruction work.

The present economic position of France is good. Her industrial population is fully employed. Her output in most fields of production is limited only by the dearth of man power. The reconstruction of the devastated areas is fast approaching completion.

Her foreign trade already has surpassed its pre-war figures and is improving with her colonies, as well as with the rest of the world.

The attitude of the French people toward their own currency is important. The task of the Government at this time is to restore confidence in the franc in the minds of the widest circle of the French public, for it is failure of their internal confidence, not foreign speculation, which would prove their undoing.

The currency scituation may be handled in any one of four different ways: Restore the currency to the old metal parity reduce the value by exchanging smaller amounts of new paper for the old; establishing a new metal value; or allow it to pass out of circulation as being worthless.

The best authorities are inclined to the opinion that France will ultimately follow the sensible course of establishing a new metal value for the paper franc, probably not much above its present gold value.

The budget for the first time since the war is one and indivisible. The French have now abandoned the practice of having a general budget and a special budget or the recoverable one, to which was charged the expense of reconstructing the war devastated areas, the amount being a charge against reparation payments from Germany which were generally unpaid. The deficit this year is estimated at about 2 billion francs.

CONCLUSIONS

Industrially and commercially France is one of the soundest nations in the world; its foreign trade is practically balanced; its invisible exports bring in large sums every year; the wealth of the French people is very great and is being added to continually.

France is sufficiently powerful and financially able to finance a war of short duration that had the support of the people, but could not finance a war of long duration without financial help from some other country.

E. COMMUNICATIONS

Animal.—The number of horses and mules is rapidly approaching pre-war figures and is nearly sufficient to meet industrial needs. It is believed that in a few years the pre-war status will be reached.

Motor.—The motor equipment seems adequate to meet industrial and military needs in time of peace, but would require a large increase in event of hostilities.

Aerial.—France has established and is operating regularly great aerial transportation systems for the transporting of passengers and freight. These systems cover the whole country and connect with near-by colonies and with all important cities of Europe. As France now is far ahead of all other countries in aerial transportation, it may be expected that, as this means of transportation is improved

until it becomes a military asset, she will be found far in the forefront.

Railroads.—The great railroad systems which cover France with an excellent network of communications are of incalculable value from a military point of view. Many of these lines have been constructed to meet possible military needs.

All damage which occurred to the railroads during the World War has been repaired and pre-war schedules are being maintained.

The electrification of all railroads, started several years ago, is progressing and is expected to be completed in about 15 years. This electrification will result in a large saving in fuel and the release of much rolling stock now used for hauling fuel.

The rolling stock has been increased greatly in number, while locomotives have been improved in power and freight cars in capacity.

The railroads may be considered to be much superior to those existing before the World War and fully adequate to meet the demands of any major operation.

Inland waterways.—The navigable rivers and canals of France form an important adjunct to other communications systems, principally for transporting slow-moving freight and for supply of the civil population in event of war. The damage to canals occurring during the war has been repaired and the system is operating regularly and efficiently.

Roads.—The very complete system of roads is a very valuable military asset, as it greatly facilititates the movement of troops and supplies. The roads deteriorated greatly during the World War and lack of funds has prevented their proper repair. The type of road in France deteriorates rapidly under the stress of operations and requires an enormous increase in personnel and money for upkeep.

Radio.—France has made great advances in the means of radiotelegraphy and now has an adequate system for communicating with her colonies and possible allies and for locating hostile sending stations, both on land and sea. It is believed that this system is adequate for any emergency.

Telegraph.—The telegraph system, while apparently meeting commercial needs, is old and not well operated as compared to American standards. Attempts have been made from time to time to secure sufficient funds to modernize the system, but all attempts have been defeated. In event of war, telegraph lines constructed and operated by the military will be necessary.

Telephone.—This system is being extended and improved, but is not believed to be adequate to meet the needs of major operations without extensive augmentation by military lines.

Cable.—France is well supplied with cable facilities connecting her with her colonies and possible allies. Two weaknesses appear

to exist in this system: First, the centering of so many lines at two ports—Brest and Marseilles—which render them liable to interruption by an aggressive enemy; and, second, the fact that many of the lines connecting with outlying colonies and possible allies are owned or operated in part by other countries, which may render them of doubtful value in war.

Sea.—France has a large and efficient maritime fleet and many modern and well equipped ports, especially on her western coast. The Mediterranean coast appears deficient in port facilities, there being but one important commercial port—Marseilles. It is believed that the commercial shipping is sufficient to supply the country in event of war and to provide ample transportation for a major overseas expedition.

CONCLUSIONS

The communications of France, in general, are much superior to those existing prior to the World War, and, with the exception of the telegraph, telephone, and cable, are ample to meet the demands of any major operation, defensive or offensive, on both land and sea if the necessary extensions and readjustments are foreseen and made promptly.

(IV) Military Situation

A. PERMANENT MILITARY AND NAVAL ESTABLISHMENTS

General military doctrine, policy, and missions.—The French military doctrine is dependent primarily on German actions. Her present doctrine is an offensive one. No definite military policy. Present French operating policy is based on compulsory military service. The mission of both the army and navy is the security of the State and upholding her rights as defined by the treaty of Versailles.

MILITARY ESTABLISHMENT

(*a*) *Organization.*—The President is nominally the commander in chief. Actually the command is exercised by the Minister of War, assisted by an advisory board known as the superior war council and the chief of staff.

The French Army consists of:

(1) Troops.
  Metropolitan Army.
    The army of Continental France.
  Colonial Army.
    Native volunteers for service in French colonies.
(2) General officers corps and general services.
(3) Staffs and special services.
(4) Gendarmerie.

The general staff is organized into three sections, each headed by an assistant chief of staff:

(1) Organization, mobilization, and transportation.
(2) Military statistics, intelligence, training, and operations.
(3) General staff personnel, administration section, physical training, school section, historical section, African section.

In time of war the chief of staff becomes commander of the armies and the other members of the superior war council become army commanders and army group commanders. The second and third assistant chiefs of staff become first and second assistant chiefs of staff of the field army. The first assistant chief of staff becomes chief of staff of the army of the interior.

The troops are organized into:

Line divisions—
White.
Mixed (1 white regiment and 2 North African regiments).
Light divisions—
Elements not assigned to divisions.
General reserves.
Services.

Line division is composed of—
3 regiments infantry.
1 regiment artillery.
3 battalions (light).
2 battalions (heavy).
1 squadron cavalry services.
Total strength 16,000 men, 460 officers.

There are 32 line divisions; 26 are in France and 6 on the Rhine or in the Ruhr.

A light division consists of:
3 brigades cavalry (2 regiments each).
2 battalions field artillery (horse).
1 company engineers.
3 squadrons armored cars.
1 group bicycle chasseurs.
Services.
Strength 9,350 men and 380 officers. There are 5 of these divisions, 4 in France and 1 in the Ruhr.

General reserves at the disposition of the high command consist of:

Tank regiments.
Heavy artillery regiments.

Cavalry regiments.
Air-service units.
Antiaircraft regiments.

Elements not assigned to divisions consist of:

Foot chasseurs.
Cyclist battalions.
Machine-gun chasseurs.
Porte artillery.
Foot artillery.
Heavy animal drawn artillery.

The 32 line divisions are organized into 16 army corps, 12 of which are in France, 3 on the Rhine, and 1 in Algeria.

The total strength of the regular army is 649,400 men and 26,453 officers, with a reserve force of 3,750,000 men, maintained by compulsory service.

(*c*) *Equipment and reserves of finished munitions.*—The French Army is exceedingly well equipped, especially with arms, including all calibers of artillery, automatic weapons, tanks, and aircraft. More ammunition, powder, and explosives are on hand in France than there are facilities with which to store them.

(*d*) *Schools.*—France has an extensive system of military schools, which, classified as to type, are:

(1) Subpreparatory school:
Instruction of sons of enlisted men and officers.
(2) Preparatory schools for commission:
Polytechnique school.
School at Sainte Cyr.
(3) Special service schools:
All branches.
(4) Schools for general officers and field officers:
Centre d'Etudes Tactiques d'Artilleryes.
Centre des Hautes Etudes Militaires.
Ecole Superieure de Guerre.

In addition to these, there are special service schools for noncommissioned officers and schools for reserve officers.

(*e*) *Efficiency and morale.*—Efficiency and morale have suffered to a great extent as a result of the reductions and reorganization. Discipline has not suffered in proportion, but is not as high as formerly.

(*a*) *Policy.*—The "Statut naval," a bill for the further organization of the navy, sets forth the policy, which is:

(1) Scrap no battleships until 1932.

(2) To build light cruisers, torpedo boats, and submarines, the first installment to be laid down between 1925 and 1930.

France ratified the Washington Peace Conference, but committed itself for only 10 years.

(*b*) *Organization.*—The Minister of Marine is the head of the naval establishment. The Ministry of Marine is divided into nine departments, and in addition there are the superior council of the navy, and several special committees. The French Navy consists of:

(1) The navy proper.

(2) The general staff.

(3) Coast defenses.

(4) Navy air service.

The navy proper has two large fleets, one known as the Mediterranean Division and the other as the Levant Division, with smaller forces on the Syrian coast, and some torpedo boats and gunboats at Corsica, Algeria, Tunis, and Oran.

The general staff, headed by the chief of staff, Vice Admiral Grasset, and two assistants, military cabinet and general staff. It is divided into four bureaus:

(1) Organization.

(2) Intelligence.

(3) Operations.

(4) Transport, supply, communications.

The coast defense is organized into 4 "naval frontiers" districts.

The navy air service comprises:

(1) Forces which cooperate with the seagoing fleet and maintain communication with France and her overseas possessions.

(2) Other formations which participate in the coast defense on "naval frontier."

(3) Aerial ports and floating bases necessary for working these formations.

In time of peace the air force comprises 50 flotillas and such dirigibles and captive balloons as the Minister may determine. This force is organized into 5 divisions, of which 1 is attached to the seagoing fleet and 4 to the coast defenses.

On outbreak of war each squadron (of which there are 200 fighting and observation in army and navy) shall be expanded upon

mobilization to 3 squadrons; personnel and material are at hand so this can be actually accomplished.

(*c*) *Strength.*—The present strength of the active French Navy is 55,000 men and about 3,500 officers, with a reserve of 114,000 men. This force is maintained by voluntary enlistments and compulsory service.

There are 6 dreadnoughts, 3 predreadnought battleships, 6 cruisers, 5 light cruisers, 51 destroyers, 47 submarines, 20 airplanes, 98 seaplanes, 1 rigid and 10 nonrigid dirigibles.

Building program: There are at present in hand and building 3 light cruisers, 6 flotilla leaders, 12 destroyers, 12 submarines.

(*d*) *Naval bases.*—Practically all of the important ports are equipped for repair and supply of naval vessels. Brest and Toulon are the largest.

(*e*) *Efficiency and morale.*—Efficiency, poor; morale, low; discipline, fair.

CONCLUSIONS

France has the best-trained, the best-equipped, and the most powerful Army in the world to-day. She can mobilize a trained force of over 4,000,000 men. As long as troops would not have to be transported overseas and if her ports were open for the import of raw materials, France could maintain an army in the field of 3,000,000 men. The low standard of the navy prevents France from engaging in war against a strong naval force unless she had as an ally equal in strength to that of her enemy.

B. POTENTIAL MANPOWER AND PROBABLE RATE OF DEVELOPMENT IN WAR

1. *Potential man power.*—(*a*) *Continential France.*—The potential man power of continental France is estimated to be on September 1, 1924, 3,630,000 males of military age, physically qualified for military service, and available. Those men required for necessary home employment are not included.

(*b*) *Colonial France.*—The potential man power of colonial France is estimated to be on September 1, 1924, 700,000 males of military age, physically qualified for military service and available for use as combat troops or labor troops. While the population of colonial France is approximately 55,000,000, the French experience in the World War indicates that not more than 700,000 men can be rated as available due to the undeveloped state of a major portion of this population.

(*c*) *Total man power.*—The potential man power of France is the sum of the potential man power of continental France and colonial France, or 4,330,000 men.

2. *Probable rate of development in war.*—(*a*) *Continental France.*—Upon mobilization it is estimated that 2,000,000 men, which number includes 10 classes in addition to those with the colors, will entrain by the tenth day, and complete mobilization by the fourteenth day. Recruitment rate alone considered, the remaining 1,630,000 can be mobilized by the twentieth day.

(*b*) *Colonial France.*—Two hundred thousand troops in North Africa are always mobilized and can be concentrated in France in 15 days, the transportation rate permitting. Five hundred thousand remaining combat troops and labor troops, in various colonies, can be mobilized ready for transportation at the rate of 50,000 per month for 10 months.

(*c*) *Total rate of development in war.*—The total rate of development in war is therefore estimated to be 2,000,000 men in 10 days, 2,200,000 in 15 days, 3,830,000 in 20 days, and thereafter 500,000 colonial combat and labor troops at the rate of 50,000 per month for 10 months.

CONCLUSIONS

War Department studies and war plans, in which France is included, should be based on a potential man power of France of 4,330,000 men and a probable rate of development in war of 2,000,000 men in 10 days, 2,200,000 in 15 days, 3,830,000 in 20 days, and 4,330,000 in 10 months.

CONCLUSIONS OF THE COMMITTEE

1. France is the dominant power in Europe to-day and has the potential man power and resources with which to maintain this supremacy, having organized the best-trained, best-equipped, and most powerful force in Europe.

2. The most probable enemies of France are England, Germany, Italy, Russia, and Austria and Hungary.

3. The French strategic policy on continental Europe is offensive, but because of her lack of a powerful navy and her numerous colonies, it is otherwise defensive. She may be expected to continue her present alliances and friendships in order to maintain her present position and to make her strategic policy effective.

4. In a case of war involving the United States with Red, Orange, Green, or any combination of these powers, France can be relied upon to remain neutral.

GERMANY

ARMY MANEUVERS

September, 1924

The German maneuvers of September 4 to 9, 1924, show the army, according to our standards, to be above average in training, discipline, and fighting efficiency; superior in orders, staff work, and high command. The main features of the maneuvers were the efficiency of the umpire service (so often not attained in our service) and the simulation of equipment forbidden by the Versailles treaty. To quote the report of Major Kimberly, the American attaché: "The umpire service was very thorough; each unit to the company had with it a reliable noncommissioned officer as assistant umpire, who was trained in the work and could make local decisions. The larger units had officers up to and including general officers. Umpires were in automobiles or mounted, and assistants with infantry on foot. Communication between umpires was by telephone, motorcycle, bicycle, horse, and visual signaling. An elaborate telephone net was placed over the entire maneuvers ground by the signal troops during the two days preceding the maneuvers, and where practical the telephones in public service utilities were hooked into the net, such as railway stations, police stations, and post offices. The umpires, in unison, made a map study of the ground and maneuver problems in Berlin previous to the maneuvers. They preceded the troops to the ground one day and were well versed in their duties. The umpire service impressed one as being thorough, sufficient, and efficient. Decisions were given with promptness and judgment."

Quite a bit of ingenuity was used in the simulation of forbidden equipment. To simulate aviation: "An officer, specially marked and often an ex-aviator, was permitted to ride on a motorcycle unmolested through and around the opponents' line. Returning, he reported in writing to the umpire designated the result of his supposed aerial flight, the umpire permitting so much or all of the report as would be in keeping with an actual aerial flight to be transmitted to the commander sending out the aviator. Antitank guns were made of wood and stovepipe with sights. Airplanes—none in Reichswehr, but commercial airplanes en route to and from Poland and Konigsberg—circled the field daily and machine-gun fire thereon was simulated by the side over which the airplane happened to be. Tanks: Frames of small tanks were made of light wood, covered with canvass, camouflaged, placed on wheels and pushed by men inside." The assistant umpires assigned to com-

panies, etc., were provided with smoke producers, which the umpires used to represent enemy artillery fire within their own line. It reminds one of our lack of equipment during the early days of the war and may serve as a suggestion to our forces in case certain arms are missing during maneuvers.

GERMANY

FURTHER ACTIVITIES OF DORNIER METAL AIRPLANE BUILDING WORKS

November, 1924

The Dornier Metallbauten, through its head office near Friedrichshafen and in its chief building plant near Pisa, Italy, is actively pushing the development of metal airplanes, particularly with reference to the foreign markets of Japan, Spain, and South and Central America. On account of German restrictions, most of the building work is done outside of Germany.

The principal types produced are:

Dolphin, commercial seaplane.

Comet, commercial airplane.

Libelle, small commercial seaplane.

Wal, large twin-engined flying boat.

The characteristics of these types are already well known. Dornier alleges that refinements are continually being made.

New designs reported are a single-seater fighting plane (for construction in Japan), a two-seater observation plane (also for Japan and Italy), a torpedo carrying plane for Japan.

As regards engines, Dornier sticks to B. M. W., 180 h. p.; Rolls Royce Eagle; Hispano Suiza, 300 h. p.

A few Liberty engines were supplied by the Argentine Government to be installed in Wal type planes purchased at Pisa. It is understood that Dornier would like to purchase a number of Liberty engines on his own account for use on Wal type airplanes, and it has been reported that negotiations to this end were under way, or had been concluded, in the United States. This reported purchase can not be confirmed. It is probably a fact that Mr. Dornier would like to purchase some Liberty engines if they could be bought for a low figure. If purchased, they would be used at Pisa, not Freidrichshafen, and would no doubt be installed in Wal type airplanes for Central America, Spain, and Japan.

The Japanese are actively interested in the German metal aeroplane market, in transplanting some of this art to Japan. As a step toward this end, they are buying one or more samples of all existing German types and stationing personnel at plants for instruction during the progress of the work. Dornier's plant is no exception. Connections have been established whereby Kawasaki Dockyards, Kobe, will build to Dornier's designs and under Dornier's supervision.

A group of German supervisors went from Friedrichshafen to Kobe in June, 1924. The group comprised Herr Jast, airplane pilot; Herr Loef, supervising engineer; Herr Bucharner, foreman; three skilled mechanics; two skilled draftsmen.

Meanwhile there have been stationed at Friedrichshafen, to watch the building of sample aeroplanes, a "commission" of four Japanese head by one named "Trochio," and understood to be a former Japanese naval officer. Trochio is reported to be clever and bright, but the remaining three are young and not very intelligent students. This group has also covered the "inspection" work at the B. M. W. engine plant and another group has been stationed at the Hispano-Suiza engine plant.

It is believed, although it can not be confirmed, that this group, in addition to watching the construction of sample planes which can legitimately be built in Germany, is also supervising the preparation of designs for other (military) types to be built in Japan. It is Dornier's practice to do most of his design work at Friedrichshafen, as he obviously can do if he wishes.

The Japanese "Commission" in Friedrichshafen live quietly to themselves and are but little seen in the town. Two of them are great drinkers. They have not shown any curiosity in regard to the United States airship *ZR–3*, although obviously many back-door sources of information have been available to them.

On October 15, 1924, Herr Dornier, accompanied by his family, left for a three-months stay in Japan at the invitation of his interests there. His passports were specially arranged through the Japanese Embassy in Berlin. Herr Dornier's visit is largely to make him familiar with conditions in Japan. No business of any importance is to be settled on this visit. All that can be done along business lines is already settled. Dornier considers the Japanese to be very leisurely about business matters, and says he therefore believes it will be a year or more before active construction of metal airplanes in Japan under his supervision can commence. Once started, he expects a large business.

GERMANY

NAVAL MANEUVERS

October, 1924

The autumn maneuvers of the entire German naval forces took place the last week of August. All the commissioned ships took part, namely, the line ships *Braunschweig*, *Hannover*, *Elsass*, the cruisers *Hamburg*, *Berlin*, *Thetis*, *Amazone*, *Medusa*, 22 torpedo boats, *Panther*, *Hela*, and some other small vessels.

Each year has brought a slight increase in the number of ships in commission. When the *Hessen* is commissioned in the very near future, the maximum strength will be reached. The maneuvers were especially interesting owing to the fact that for a year the entire naval forces afloat have been under the command of the commander in chief, and he now leaves this tour of duty to assume the post of chief of the Navy Department. There was therefore a sort of test of the tactical or training work accomplished during the past year. The program included battle practice, night maneuvers, and a short strategic maneuver. It can be said that very satisfactory progress has been made in the training. As characteristic of the general attitude of the navy, former conditions (far more splendid than at present) were only gauged by the standard of the quality of the performance, and everything—even the slightest and most unimportant item—had to measure up to the highest point of perfection and efficiency. Any stranger viewing these latter efforts at close range feels proud that the catastrophe has not deprived us of resiliency and the will to live which will guarantee for us a new and brighter future. To-day no once can discover a threat underlying the military activities of our meager means of defense. These activities, however, will show to all nations that we wish to advance and improve. This must suffice for the present.

There was very stormy weather during the second half of the maneuvers so that the torpedo boats had to be discharged under the land, and the cruisers also had a difficult time of it: even the line ships had to work, which is always a good thing, as it enables them to appreciate better the difficulties of the others. After a rest of several days in Swinemüde, the chief of the Navy Department visited the ships in company with the Minister of Defense. They were saluted and raised their flag on the *Hanover* or *Berlin*. The direction of the stragetic maneuvers lay in the hands of the commander in chief. This was his last appearance with the fleet. After the close of the maneuvers the ships anchored at Sassnitz in order to give the people on land an opportunity to visit the ships which were

drawn up in four rows. Then the entire force passed in review before the retiring commander in chief, who was on the fleet tender *Hela*, and entered Swinemünde. A discussion of the last maneuvers and exercises took place on September 10, and that same evening Admiral Belmcke took leave of the officer corps, while garrison and crews prepared for him in front of the Kurhaus a solemn torchlight parade with music by a regimental band. The admiral's flag was again lowered and the younger generation saw a beloved and deeply honored leader pass from them.

The discharged groups then returned to their respective harbors in order to give the crews leave and begin preparations for the autumn assignments of duty.

GERMANY

RANGE FINDING AT SEA

(Translation of an article in the German press)

The well-known dictum that the best range finder of all is the gun, has in naval warfare in these our own times been proved to be fallacious to a certain extent, but, on the other hand, the notion that good gunnery first and foremost depends upon good range finding is wrong also. As in the German Navy, everything connected with range finding, in view of the special construction of the implements used, was looked upon as "secret"; there was often, even among those immediately concerned, a good deal of ignorance on this subject as regards the value and importance of military range finding. By sifting the experience gained in the war, and by abandoning the idea of special secrecy with respect to the stereoscopic range finders with movable indicators used in the German Navy, interest in range finding has become much more keen in all navies, so that it is well worth while investigating, from the German point of view, the military side of this question and the use and exploitation of the instruments in connection therewith.

In doing so we must of course put aside all purely technical questions and matters of construction, for then we can only refer our readers to the exceptionally interesting book which has just been published, written in a form which is not beyond the understanding of the average layman, namely: "Telescopes and Range Finding Instruments," by Dr. A. König, of the firm of Carl Zeiss, Jena.

The military requirements of naval range finding may be summarized as follows: (*a*) A starting or initial range; (*b*) range finding

by time, in which the lengthening or shortening of the range within a given unit of time—one minute—is determined.

The starting or initial range is the mathematical range, which must be adapted according to the arms to be used by the gunnery officer. The arms, or at any rate the artillery, require a range which represents the application of a great number of divers improvements upon (i. e., corrections of) the mathematical range; that is to say, the range the instrument is expected to indicate. It follows that the range finder with its initial range constitutes an extremely important, but by no means the only, basis for the position of the first shot or first broadside. Inasmuch as the various corrections or improvements of the range measured by the instrument, to allow for the movement of one's own ship and the movement of the target, for ballistic and meteorological factors, are based upon more or less accurate observations, estimates, and experience, it follows that the most important essential is that at least the mathematical range, which is the basis of the firing range, should under all conditions be quickly, reliably, and accurately furnished by the instrument.

When the gunnery officer, by means of the range as measured by the range finder and corrected as indicated above, has determined the firing range, and by trial shots has rectified the fire and eliminated possible errors in the initial range as given by the instrument, then arises the demand for the second essential to be provided by the range finder, namely, the quick and accurate determination of the rate at which the range is modified (lengthened or shortened) by observation (measurement) extending over a fixed unit of time—one minute. If the initial range was a very important auxiliary in making the projectile hit the target, the subsequent constantly repeated observations, i. e., measurements, are one of the many tricks and devices of holding on to the target, i. e., range. Granting that the range finder is indispensable for determining the initial range, as fire proceeds it becomes a very valuable but not by all means absolutely necessary auxiliary and controlling apparatus.

From the very nature of conditions on board ship it would appear that the only type of range finders suitable for meeting the demands made upon these instruments, and briefly indicated in the foregoing, are stationary instruments for determining ranges either with a base of known length on the target or with the length of the apparatus itself as the base. Instruments of the former type were the German stationary range finder and the hand range finder, instruments of a very special delicate kind, with every detail thought out

and executed to perfection, evolved by the firm of Carl Zeiss, Jena, in conjunction with the naval authorities; very valuable instruments on board ship to this day. The British Navy at an early date used instruments constructed in England with short bases of their own; the German Navy did not adopt this type of range finder until 1905. This type of range finder with base is used in three different forms, namely: (1) The coincidence telemeter, showing an image of the target dissected by a horizontal dividing line; (2) the inversion telemeter, showing one upright and one inverted image divided by a horizontal line; and (3) the stereotelemeter, which shows the image in a plastic form, as in the stereoscopes we all know.

These three forms of construction merely represent different methods of solving the same problem, and theoretically they are of equal efficiency, so that it is a matter of individual opinion which form should be given the preference.

The German Navy, after careful tests made at the time, decided to adopt the stereoscopic range finder, which is the only range finder used on board to this day.

The stereotelemeter uses the faculty which every human being is born with, the faculty of seeing objects in a plastic form with both eyes, and builds up its method of range finding upon the natural process of seeing and comparing with two normal eyes. The other two forms of construction make use of one eye only, and bring before this eye from each end of the instrument parts of the image, which, sharply separated by a dividing line, constitute one complete image, the inversion telemeter presenting an upper—inverted—and a lower—upright—image, the coincidence telemeter showing two upright halves of the image. The determination (measurement) is effected in the stereotelemeter by an apparently moving mark or indicator in the field of vision being brought into the same distance as the target; in the inversion telemeter, by bringing two identical points in the upright and in the inverted image (the point of a mast, for instance, or a funnel) into line and contact with each other on the horizontal dividing line; in the coincidence telemeter, by uniting the two halves of the image on the dividing line in such a way that they form a perfect image, masts, funnels, and straight lines coinciding and running into each other connectedly and without any distortion of the picture.

It is obvious to anyone that the most convenient and natural solution of the problem of range finding is the stereotelemeter, which gives the observer the most perfect picture visible with both eyes. Whereas both coincidence and inversion telemeter require the target to present certain special features, such as prominent points or straight lines, the stereotelemeter permits of the location and observation of every kind of target that is visible. Thus the observation

(and measurement) of a cloud, either natural or produced by the bursting of a shell, of a column of water, of the impact of a projectile, of funnel smoke, artificial fog or smoke screens—that is to say, targets with irregular, constantly changing contours, without points or straight lines—is probably only possible in practice with the stereotelemeter. Moreover, the latter gives the observer a uniform, clear, and comprehensive picture which differs from one viewed with unaided eyes only in that the effect of perspective is better, more plastic, whereas the images seen in all monocular apparatus are flat, unnatural. Consequently the stereotelemeter is also the observation instrument which is preeminently suitable for the detection and investigation of difficult tactical positions and for navigation purposes, work in which it has already rendered invaluable service during the late war. The gunnery officer on the bridge or in the main top is at all times, when the situation is a difficult one, able to look through the range finder himself and to look over the situation for himself, and if necessary to take his own observations; on the bridge of the flagship no commander will be able to dispense with observations through a big scale stereotelemeter. For this kind of extra work and duties monocular range finders are useless in any case. Apart from the fact that the stereotelemeter is absolutely independent of the shape, form, or nature of the target, its superiority in dull weather, bad visibility, in twilight, and at night is especially striking and has been proved both by the experience of the war and by experiments since then. It has also been proved that ordinary vibration of the ship not only does not interfere with observations, with the indicators adopted by the navy, but acutally helps them by assisting in improving the plastic form of the picture. In the case of moving targets and in sudden great changes in the course of the ship, matters of practically every day occurrence on board ship and with targets in the air (aircraft), the stereotelemeter surpasses all the other types, as the system of broad indicators does not require such minutely accurate adjustment to the target, according to altitude or latterally, as either the coincidence or inversion telemeter.

In torpedo boats, submarines, and other small vessels the heavy rolling of the vessel will frequently render observations with the coincidence or inversion telemeters abortive, whereas even then the stereotelemeters will give very useful results. Under certain circumstances, in submarines and small vessels, it will be found very useful to have a stereotelemeter with fixed indicator, although allowance will have to be made for the disadvantage that the observer has to do his own reading inside the instrument.

The easily accounted for and much quicker tiring of the human eye, which has been noted when taking observations with monocular range finders, compared with the stereotelemeter, is another proof of the advantage of stereoscopic range finding based upon the natural process of vision.

The question of personnel to handle the instruments is undoubtedly more complex in the case of the stereotelemeter than in that of the monocular instruments, as the fundamental prerequisite for stereoscopic range finding is a well-developed faculty to see things in a plastic form with both eyes. It has, however, been proved that this faculty, with which every healthy normal human being is born, has only in comparatively rare cases become atrophied owing to faulty formation or unequal eyes or on account of the eyes having, in trade or profession, accustomed themselves to look at flat surfaces or objects. The percentage of males among adolescents unsuitable for work with the stereotelemeter is not more than 5 to 10 per cent; a further 10 to 15 per cent, although having suitable eyes to start with, lose the faculty in the course of training and do not become efficient observers. There is no strain upon or injury to the eyes consequent upon extended periods of work with the stereotelemeter, not even in cases where the work has been performed for years on end. Of course it must be taken for granted that the range finders used are of the very best optical workmanship and absolutely in perfect condition.

As regards accuracy of observation (determination of range), there is in theory no difference between the various types of stationary base apparatus. In practice, however, careful experiments in the German Navy have resulted in proving the superiority of the stereotelemeter, which was especially remarkable with targets without a background or with moving targets. The figures for theroretical errors in the efficiency of the eye or of both eyes, worked out for certain instruments of a given base and telescopic magnification, and on the basis of a terminal angle at the target of 10″, show under favorable conditions errors much too great for experienced observers; whereas in practice on board ship, under less favorable conditions, one has to reckon with double and three fold theoretical errors; in other words, with errors in the angle at the target of 20″ to 30″. To give an idea of what may reasonably be expected of a range finder and its attendant observer, I might mention that the theoretical error of an instrument with a base of 3 m. and 23-fold magnification is about 18 m. for a range of 5,000 m., 70 m. for a range of 10,000 m., and about 285 m. for 20,000 m. There are three possible ways of in-

creasing the degree of accuracy of the instrument, so earnestly desired by all who have to use them:

(*a*) Lengthening of the base.

(*b*) Greater magnification.

(*c*) Reduction of the error in the angle at the target.

Whereas (*a*) and (*b*) are in the main dependent upon the nature and object of the work the instrument is called upon to perform, in the case of (*c*) reduction is possible both by making the instrument more perfect from the optical and mechanical point of view and by increasing the efficiency of the men whose duty it is to handle them. The perfecting of the instrument is a matter of the scientific and mechanical efficiency of the firm manufacturing the instrument—that is to say, a technical question—whereas increasing the efficiency of the range finding staff is a military matter.

Setting aside for the moment the matter of the construction of the apparatus, it is first and foremost a question of selecting, with the most punctilious care, the men likely to prove most suitable and then to train them thoroughly and on right lines in order to insure that everything shall be got out of the instrument that it is capable of performing and that the ranges found shall be as accurate as possible.

The fact that the German Navy adopted the stereoscopic method of range finding led to a much more thorough and scientific training of the personnel in special courses of instruction. This must, however, not be taken to mean that the inversion and coincidence telemeter require no such trained men. At the outbreak of the war it was shown that men who had once been trained in the use of the stereotelemeter, men really suitable for the job, were able to do excellent work again in a very short time, although they had not touched the instrument for years, and that constant practice, age, and even general talent do not affect the accuracy of the observations to the same extent as the peculiar fitness for this work inherent in certain individuals, a quality which can only be detected by careful examinations and selection of the personnel.

The simple process of seeing and comparing with two eyes, as in the stereotelemeter—in other words, a perfectly natural process for the observer—compared with observations with monocular apparatus which call for a certain degree of forced imagination, makes it obvious that the natural excitement of the observer in battle has not nearly such an adverse effect upon the observation (measurement) with the stereotelemeter as with the coincidence or inversion telemeter. Thus the gunnery officer of H. M. S. *Derfflinger* confirms in his book, G. v. Hase "The Two White Races," that the stereoscopic

base range finders had proved themselves excellent instruments in the Skager-Rack battle, and that the men, notwithstanding the excitement of the battle, had worked reliably and accurately.

The contrast presented by the following extract from the gunnery officer of the English battleship *Benbow*, referring to the same Skager-Rack battle, shows that the men serving the coincidence telemeter allowed their attention to be diverted very easily:

* * * 6.38. Turrets A and B fired; the target was hidden by smoke emanating from an enemy cruiser, drifting between the *Benbow* and the enemy's lines. Several range finders on the *Benbow* evidently took observations of the drifting cruiser in mistake instead of the ship at which we were firing. (English Bluebook.)

This report is also instructive for another reason, namely, that the error made by the observer in fixing on another target is easy to understand, being due to the flat appearance of the picture, something like the flatness of the scenery on the side wings of a stage, shown by the coincidence telemeter, coupled with the excitement of the battle. With the stereotelemeter and the plastic form of the picture produced by same the observers would at once have noticed that the drifting cruiser was much nearer than the target they wanted, and the error would most certainly not have been committed.

Range-finding experiments conducted at the naval gunnery school at Sonderburg shortly before the war resulted in the stereoscopic range finders undoubtedly proving themselves better, more accurately measuring instruments than the coincidence telemeters. With respect to aerial targets also, the examination of the photogrammetrical controlling impressions, taken on the occasion of range-finding experiments against aircraft, made in the German Army shortly before the war, proved that the only stereoscopic range finder available at the time for the purpose of these experiments, made by the firm of Carl Zeiss, Jena, was superior to all other types as regards accuracy of determination. ("Technik und Wehrmacht, 1922, vols. 11 and 12. Range Finding in Ballastics and the Technics of Shooting, by Maj. Dr. Carl Becker, Engineer.")

To give an idea of the work performed by the stereotelemeter of the German Navy and by the coincidence telemeters of the British Navy, respectively, in the late war, a few short extracts from English battle reports may be of interest:

BATTLE OF THE FALKLANDS ISLANDS

Owing to the great distance, to splashes caused by shots of the enemy falling short and to funnel smoke the (English) range finders were of little use. (English battle report on the Falklands battle.)

ENGAGEMENT ON THE DOGGER BANK

(?) JANUARY 24, 1915

The (English) range finders were of little value, as only a few short instruments could take observations, whereas the range was too long to make accurate reading possible. Calculation of differences in length of range was impossible. As a rule the gun was used as range finder. (English report on the engagement on the Dogger Bank on November (?) 24, 1915.)

NAVAL BATTLE OF THE SKAGER RACK—RAPIDITY IN GETTING ON THE TARGET

Undoubtedly the Germans opened fire quicker than we did and also secured hits before we did. The Germans had a better starting range than our ships, and consequently had no difficulty in opening fire with accuracy. * * * There is no doubt that the Germans frequently altered their course in order to avoid being hit. It appears that firing tactics adopted in this connection are based entirely upon altering the range. All ships, starting with the *Orion* class, should be fitted with range finders 4.5 m. long.

The gunfire of the Germans was always good from the start, and doubtless their ships got the range very rapidly. (Jellicoe, "The Grand Fleet.")

* * * Sighting distance varied greatly and was about 11,000 m. southwards on an average, but the range finders of the *Iron Duke* could not measure beyond 8,300 m. (Jellicoe, "The Grand Fleet.")

Our (the English) most up-to-date ships were, at the Skager Rack battle, fitted with 4.5 m. range finders, but the majority of the ships had only 2.75 m. range finders on board. In 1917 effective steps were taken to provide range finders 7.6 m. and 9.1 m. in length. In that year experiments were also made with stereoscopic range finders. It had become known that the Germans were using this type of range finder. (Jellicoe, "The Grand Fleet.")

In this connection it is to be noted that in the engagements referred to above only stereotelemeters of 1.5 m. and 3 m. were used on German ships. This requires to be mentioned specially as later on, on the British side, appreciation of the work done by German range finding was always wet blanketed by the assertion that bigger instruments were on board at the Skager Rack battle. As a matter of fact, it was only H. M. S. *Baden* and *Bayern* that were fitted with 8.2 stereotelemeters.

The fire of the enemy was exceptionally good; the broadsides had but little dispersion, and it appeared that the correct range was quickly and accurately found. The sequence of the volleys was rapid. (Commander's report, H. M. S. *New Zealand* in the English Bluebook.)

With reference to their own range finding, the same report states:

Range finding and observation were difficult. (Commander's report, H. M. S. *New Zealand*, English Bluebook). At 7.15 an enemy battle cruiser appeared, distance about 8,000 to 9,000 m. The ship was taken under fire at once. It was not possible to obtain a measured range before opening fire. (Commander's report, H. M. S. *Colossus* in the English Bluebook.)

Range finding was exceptionally difficult, apart from the start. * * * During the first half hour observations were insufficient to allow of determination of differences in range; all we obtained was individual measurements, which were, however, of great value in controlling the guns. (Commander's report H. M. S. *Valiant*, English Bluebook.)

ENGAGEMENT IN THE NORTH SEA, NOVEMBER 17, 1917

Opinions as to the value of range finders vary greatly. Two ships appear to have obtained good results; others report that they obtained a few readings only, and one ship reports absolute failure. Ranges were but rarely obtained before opening fire, so that in practically every case one had to start with an estimated range. Firing always lasted such a short time only, and visibility was so poor, that, generally speaking, the range finders were of little use in determining variations in the range. * * * It is reported that one of the range finders on a ship gave good results, whereas the second, under identical conditions, was a failure altogether. * * *

Starting (or initial) ranges: The starting range of the German small cruisers was not very exact, and as a rule too short, but in the case of the battleships the initial range was very exact. The observers had the impression that the ranges measured by the enemy (the Germans) were better than ours (the English). (English report on the North Sea engagement on November 17, 1917.)

That to-day several other States are on the point of adopting the stereotelemeter for their naval forces and coast defenses is without a doubt a confirmation of the fact that the road taken by the German Navy was the right one. It may be assumed that the stereoscopic method of range finding would have been far more extensively adopted, would perhaps have been universal by now if the manufacture of these instruments did not call for such a high degree of efficiency and proficiency on the part of the optical works producing them. Stereotelemeters of foreign manufacture, as far as we are acquainted with them, are in themselves sufficient explanation why they are unable to cope with the work required of them by the army and the navy.

The immense importance of antiaircraft defense in all armies and navies will doubtless revive the vexed question of binocular or monocular range finding once more. Particularly in connection with the specialized work of range finding in the air the range finding and observation instrument par excellence is undoubtedly the stereotelemeter. Its combination with an instrument for measuring altitudes, or a device by means of which the measuring mechanism of the range finder is connected with the altitude mechanism of the instruments, would probably be the best solution of the important and difficult problem of determining the range of aircraft.

Development in naval artillery, based upon experience gained in the late war, naturally also involves greater demands upon the effi-

ciency of range finders. To cope with them, the essential prerequisite is an exceptionally proficient optical industry, based upon and working according to scientific principles and advance, capable of guaranteeing the technical perfection of and constant advance in the instruments. But it also means intelligent cooperation of the fighting line, whose duty it is to assist in clearing up the various questions arising out of the cooperation of the delicate human eyes and the equally delicate and sensitive instrument.

BRAZIL

DETAILS OF RECENT NAVAL MUTINY

November, 1924

On the morning of November 4, 1924, there was anchored in the harbor of Rio de Janeiro off the Arsenal de Marinha (navy yard) practically the entire Brazilian Fleet. The battleships *Minas Geraes* and *São Paulo* were anchored 500 yards apart. The *Minas Geraes* was flying the flag of the commander in chief, Rear Admiral Penedo. On board the *São Paulo* were the executive officer, four officers of the grade of lieutenant or above, several junior officers, and about 500 sailors, the remaining personnel attached to the ship not having returned from liberty.

At 8 o'clock Lieutenant (Junior Grade) Castagno and two other junior lieutenants arrested the executive and the other senior officers, imprisoned them in their rooms, took charge of the ship, and hoisted the red flag. Though some dissension arose amongst the officers and crew over this course, Castagno won over the doubtful officers and sailors and steam was immediately raised.

The Minister of Marine, upon being informed of this condition by telephone, hastened to the arsenal and immediately put off in a launch, accompanied by the Commander in Chief, and headed for the *São Paulo*. The *São Paulo* then fired upon the launch and the Minister of Marine and the Commander in Chief went on board the *Minas Geraes*, where they were received with cheers. In the meantime the *São Paulo* had signaled the shore to send off their liberty parties then on the dock with those of the *Minas Geraes*. The *São Paulo* then fired two 6-pounder shots in the general direction of the shore, and the liberty parties were hastily embarked. The launches containing the liberty parties, however, arriving near the two ships, went alongside the *Minas Geraes*, where all the sailors of both vessels were taken on board. In the meantime the revolu-

tionary officers in the *São Paulo* sent the following radiogram to the *Minas Geraes*:

From: The officers and crew of the battleship *São Paulo*.
To: The officers and crew of *Minas Geraes*.

The battleship *São Paulo*, hearing the just call of the people of Brazil, have resolved unanimously with other elements of the navy and a large part of the army to assume a repressive attitude against the irregularities of the actual Government. On account of this break, invite the *Minas Geraes* to accompany us on our cruise. Reply must be given in 10 minutes after receipt of this. In the event it is affirmative, you must call together the officers and crew, and those who do not wish to adhere shall be disembarked immediately. The *São Paulo* has fires lighted and is ready for combat.

Some time elapsed after the sending of this telegram, to which it is not believed the *Minas Geraes* made any reply. The other units of the fleet remained loyal, except the old torpedo boat *Goyaz*, worthless from a military point of view, and used at present as an instruction ship for the midshipmen. There were no officers on board the *Goyaz*, but the crew hoisted the red flag and presently got under way and steamed up the harbor.

At 9 o'clock the *São Paulo* got under way and circled slowly about near the *Minas Geraes*. At 9.30 she fired one 6-pounder shot into the *Minas Geraes*, which passed through the galley and cut off the arms of a cook. For some time the *São Paulo* continued to circle slowly about the upper harbor, the revolutionists evidently waiting in the hope that other ships would join in the revolt. The *Minas Geraes* made no move toward checking the career of the *São Paulo*, though at the extremely short range it would have been a very simple matter to destroy the bridge or otherwise disable the vessel without serious damage.

At about 10.30 the *São Paulo* headed down the harbor for the entrance, steaming very slowly and followed by the *Goyaz*. In the meantime all forts in the harbor had hoisted the national flag, but they made no attempt to stop the *São Paulo*. Since this revolt was directed against the President, and the palace of the President is on the water front, the spectators expected to see the *São Paulo* bombard the palace. However, after the shot fired into the *Minas Geraes*, no further shots were fired by the *São Paulo* in the harbor.

At 11.16 a. m., when the *São Paulo* was just clearing the entrance of the harbor, Fort Santa Cruz opened fire upon the vessel. The *São Paulo* then returned the fire with her 4.7s and 12 inch. The fort, apparently, did not hit the *São Paulo*, but at least one 12-inch salvo from the *São Paulo* struck the masonry of the fort. The *São Paulo* continued to stand out to sea as she fired. About 11.40 a. m. Fort Copocabana opened fire on the ship. The ship did not return the fire of this fort, due presumably to the fact that a thickly popu-

lated residential section of the city lies directly behind the fort. This engagement continued for some time, the *São Paulo* slowly increasing her range and apparently undamaged.

At 1 o'clock Fort Lage, within a few yards of which the ship had previously passed, commenced firing with a considerable range. The firing was very slow on both sides, and the firing of the forts was so extraordinarily inaccurate as to indicate to an observer a desire not to hit the ship.

At 2.45 the forts ceased firing, the ship then stading to the eastward and almost hull down.

The *Goyaz* turned back immediately Fort Santa Cruz began firing. She first headed toward the Nictheroy shore and then steamed back up the harbor and anchored about half a mile away from the *Minas Geraes*. She hauled down the red flag and surrendered shortly afterwards.

Directly the revolt of the *São Paulo* began, many police reserves were stationed in the streets to maintain order. The water front and the various streets near the President's palace were closed to traffic. Since the streets in this section constitute the main artery of city traffic, there occurred immediately a remarkable congestion of automobiles, trucks, and wagons. Aside from the confusion induced by this, there was no extraordinary excitement displayed by the citizens, nor did any symptoms of a general revolt arise. The water front was lined with thousands of people, who regarded the engagement with curious indifference except appreciation of the spectacular features of the affair. There were no riots, and directly the *São Paulo* had put to sea the city returned to normalcy. However, the precautions employed to safeguard the life of the President were increased beyond what they have been.

At 5.30 p.m. the *Minas Geraes* got under way, stood outside the harbor, maneuvered off Copocabana, returning in the early part of the evening and anchoring in the bay opposite the President's palace.

On November 5 the destroyers and the *Minas Geraes* placed warheads on their torpedoes. During the night of November 5–6 the *Minas Geraes*, the Minister of Marine, and the commander in chief on board sailed from Rio de Janeiro, destination unknown, followed by one destroyer and one submarine. The submarine later returned to the harbor.

On November 7 the *Barroso* and three destroyers sailed. Two of these destroyers took up station well off the entrance of the harbor of Rio de Janeiro and established patrol which continued until November 10.

When the revolt occurred, the *São Paulo* had a full supply of provisions and fuel. She was, however, short of water and her con-

densers were not functioning well. Apparently shortly after she disappeared below the horizon after the combat she headed south, for on the evening of the same day she was sighted 35 miles south of Rio de Janeiro standing to the southward. From various reports received, it is evident that she pursued a general southerly direction after leaving Rio de Janeiro, steaming at about 8 or 9 knots. She made no effort to enter any Brazilian harbor.

At 6 a. m., November 10, the *São Paulo* anchored at Punta del Este and requested a pilot from Montevideo. The red flag was then hauled down and the Brazilian flag hoisted. The Uruguayan Government sent a pilot and the ship anchored at Montevideo at 1 p. m. on the same day. About 6 officers and 200 of the crew remained on board as loyal to the existing Brazilian Government. The other officers and remainder of the crew went ashore and requested asylum of the Uruguayan Government. The *Minas Geraes* arrived at Montevideo on November 11 and the *São Paulo* was handed over to her. There was apparently much fighting amongst themselves on the part of the revolutionists during the voyage of the ship.

The vessel arrived at Montevideo in bad candition and with little provisions or water left.

SPAIN

SHIPS OF THE PRESENT SPANISH NAVY

November, 1924

The following data was received from the Ministry of Marine under date of November 3, 1924.

Class of ship	In service	Building	Projected
Battleships	2		
Protected cruisers	4		
Light cruisers	2	3	
Destroyers	4	5	
Submarines	8	Various (8).	28

Ships under construction

[Data taken from daily newspapers]

Class	Tons	Characteristics	Remarks
Light cruiser Don Blas Lezo.	4,725	29 miles speed; 6 Vickers guns, 150 mm.; 4 antiaircraft, 76 mm.; 2 triple torpedo tubes; similar in type to British Dauntless	To be delivered about the end of this year [1924].
Light cruiser Principe Alfonso.	7,850	33 miles speed; radius of action, 1,200 miles at full speed, 5,000 miles at speed of 15 knots; eight 150 mm. guns, 4 antiaerial guns, 101.6 mm.; 12 torpedo tubes; crew, 645 men. Similar to French type "Primauguet."	To be launched before the end of this year. Building at El Ferrol.
Light cruiser Almirante Cervera.	7,850	Similar to Principe Alfonso	Building at El Ferrol.
Destroyer Velasco, destroyer Juan Lazaga.	.....	Similar to destroyer Alcedo just launched. This destroyer has reached in the tests a speed of 38 knots, being considered as one of the fastest ships in the world.	To be delivered within three or four months.
Gunboat Dato			Do.
Submarine B5			Do.
Submarine B6			Do.
3 destroyers, 6 submarines, C series.	1,750		Under construction in Cartagena.

20 November, 1924

PRESENT NAVAL ESTABLISHMENT—SHIPS OF THE SPANISH NAVY

The old protected second-class cruiser *Reina Regente* is actually in the dockyards of Cadiz in order to have its old boilers replaced by new ones if possible.

As the light cruiser *Almirante Cervera* is the last included in the law of naval construction of 1915. Admiral Miranda then being Minister of Marine, only some small ships remaining under construction, it is believed that the directorate will authorize the construction of several cruisers of 10,000 tons and some destroyers and submarines. When the term fixed in the conference of Washington for construction of warships in 1931 expires, naval writers state that Spain should have the necessary proportion of light cruisers to undertake then the construction of big battleships.

Several articles have recently appeared in the press urging the directorate to authorize naval construction, in order to prevent the paralyzation of work in the dockyards of El Ferrol and Cartegena. The fact that Spain has a long coast line and the seafaring tradition of the Spanish nation are among the arguments used in these articles in their efforts to influence the present Government authorities to adopt a favorable policy toward the navy.

A school ship for "Guardiamarinas" (midshipmen) is to be constructed at the shipyards of Cadiz. This ship will be mixed, of sail and steam.

The construction of a new airplane carrier is also urged, because the *Dedalo* has little practical value, as the recent loss of several planes during rough weather on the Moroccan coast has proven.

SPAIN

STATUS OF NAVAL PERSONNEL

November, 1924

For the present fiscal year (July 1, 1924 to June 30, 1925) the enlisted strength of the Spanish Navy is fixed at 14,000, and that of the marina infantry (marines) at 2,763. These figures include the noncommissioned and warrant officers.

The commissioned personnel on October 1, 1924, was as follows:

Figures in parenthesis indicate authorized strength.

Question mark (?) indicates that authorized strength is indeterminate.

(*a*) General corps (naval officers, proper):

	Actual	
Captain general of the navy	1	
Admirals	5	
Vice admirals	8	
Rear admirals	12	
Captains	27	
Commanders	64	(63)
Lieutenant commanders	120	(116)
Lieutenants	132	(281)
Lieutenants (j. g.)	128	(?)
Ensigns	114	(?)
Total	611	

Of the 114 ensigns, 59 are "ensigns of the second year," and 55 are of the first year; the last year ensigns are still at the naval school.

In addition to the above, there are the following, classed as midshipmen, all at the naval school:

Guardiamarinas, second year	61
Guardiamarinas, first year	68
Aspirantes	47
Total midshipmen	176

Shore-duty list (*Ecole de Tierra*).—These officers, though a part of the general corps, are available only for duty on shore. This list

has been ordered abolished by the royal decree of August 23, 1924: this is to be done gradually by not filling vacancies that may occur.

Captains	29
Commanders	42
Lieutenant commanders	93
Lieutenants	16
Lieutenants (j. g.)	2
	182

Auxiliary reserve list.—Composed of former petty officers and warrant officers, for duty as adjutants in the headquarters of various naval districts, who were given commissioned rank. They never go beyond lieutenant, retiring in that grade at the age of 64 years.

Lieutenants (j. g.)	43

Reserve situation.—Occupied for two years after reaching the prescribed age for leaving the active list. Officers may be placed in the "reserve situation" at their own request.

Admirals	2
Vice admirals	17
Rear admirals	50
Captains	24
Commanders	17
Lieutenant commanders	6
Lieutenant	1
	117

Created by Royal decree of November 19, 1913:

Second officers	40

Summary:

Naval officers	611
Shore duty officers	182
Auxiliary reserve	43
Other corps	927
Total officers of the navy	1,763
Officers of the naval reserve	40

Officers of the "reserve situation" are disregarded, as the majority of them are quite old, and occupy status practically equivalent to the "retired list."

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